U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

SEARCH REQUEST FORM

Requestor's Name: Cliff Waterlaus

Serial Number: 09/260,250

Date: 6/23/2000

Phone: 306-9177

Art Unit: 3627

Search Topic:

Please write a detailed statement of search topic. Describe specifically as possible the subject matter to be searched. Define any terms that may have a special meaning. Give examples or relevent citations, authors, keywords, etc., if known. For sequences, please attach a copy of the sequence. You may include a copy of the broadest and/or most relevent claim(s).

a drill pipe and joint such as in U.S. Pat. No. 6,010,163 with a pipe outer diameter of about 6 inches and a joint outer diameter of about 7 inches. A table showing a range of pipe and joint specifications is desired. See attached brochures and claims.

Cliff
I didn't find much—
I think the Standard will help you the most.
Karen 306-5783

3627 | 1220

00-06-26A07:48 1249

STAFF USE ONLY

Date completed: 6/26/00

Searcher: KGL

Terminal time:

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CPU time:

Number Searches:

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Type of Search

- N.A. Sequence
- A.A. Sequence
- Structure
- Bibliographic

Vendors

- IG
- 1.00 STN
- 1.00 Dialog
- APS
- Geninfo
- SDC
- DARC/Questel
- Other

PTO-1590 (9-90)

Patent Assignment Details

Reel/Frame: 010926/0319 **Received:** 07/24/2000 **Recorded:** 06/26/2000 **Mailed:** 09/08/2000 **Pages:** 2
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Total properties: 1

1 **Application #:** 09521408 **Filing Dt:** 03/08/2000 **Patent #:** 6360831 **Issue Dt:** 03/26/2002
PCT #: NONE **Publication #:** NONE **Pub Dt:**
Title: Borehole opener

Assignors

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Search Results as of: 12/5/2003 8:53:42 A.M.

If you have any comments or questions concerning the data displayed, contact OPR / Assignments at 703-308-9723
Web interface last modified: Oct. 5, 2002

	Type	L #	Hits	Search Text	DBs	Time Stamp
1	BRS	L1	83	285/$.ccls. and drill and (ratio or equation)	USPAT	2000/06/16 10:47

pattern to transport bitumen from the Orinoco belt. Different flow conditions were tested; however, there was a need to further study the influence of **pipe** length on the flow behavior. MARAVEN with INTEVEP and Shell designed and built an instrumented commercial line to transport the bitumen produced in the Zuata area of the Orinoco belt, between the San Diego Norte Pilot Project (SDNPP) and the Budare 2 station of CORPOVEN. The **pipeline**, 54.7-km long and **152** **mm** in diam, runs aboveground without insulation, through a hilly terrain with a net level difference of 63 m. Eight measurement stations transfer pressure data to the control room in San Diego Norte. Although the results from the San Tome test loop showed that the optimum water fraction should be ca 10 to 12% for steady state conditions, it also proved that in the case of an emergency shutdown, the pressure peak during the restarting process is lower at higher water fractions. Therefore, the tests in the San Diego-Budare **pipeline** were performed with water fractions above 20%. A test program is being conducted at a laboratory scale, to test different chemical additives in the water phase to avoid fouling.

L2 ANSWER 6 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 92:4580 TULSA
DOCUMENT NUMBER: 520671
TITLE: RESEARCH AND DEVELOPMENT IN ANNULAR FLOW (INVESTIGACION Y DESARROLLO EN FLUJO ANULAR)
AUTHOR: GUEVARA, E; ZAGUSTIN, K; PATERNO, J; TRALLERO, J L; ZUBILLAGA, V; ZAMORA, G; DIAZ, T
CORPORATE SOURCE: INTEVEP SA; MARAVEN SA; CORPOVEN SA
SOURCE: REV TEC INTEVEP V 9, NO 2, PP 163-173, JULY-DEC 1989 (ISSN 02514478; 7 REFS; IN SPANISH). ; Journal
LANGUAGE: Spanish
AB The results of a research project on the transport method for heavy crudes using the core-annular flow mode of operation are presented. The project is being carried out by INTEVEP with the cooperation of MARAVEN, CORPOVEN and Shell. Emphasis is placed on stages corresponding to the tests performed in the 203 mm diameter and 1,000 m long loop in San Tome. Also, descriptions of the facilities and the preliminary tests are presented for the **152** **mm** diameter and 54.7 km long commercial **pipeline**, located between San Diego Norte and Budare. The results of the tests performed in San Tome allowed determination of the dependence of the pressure gradient as a function of the injected water fraction and the flow velocity. The wavy crude-water interface characteristics were also obtained, and were used to formulate a phenomenological model for the prediction of the pressure gradient. Moreover, an operational procedure was developed for the reestablishment of the core-annular flow mode after a long period of no-flow. The preliminary tests on the 54.7-km **pipeline** indicate that the core- annular flow condition remains stable with distance and that the pressure gradient coincides with the value obtained from the theoretical model developed by INTEVEP.

L2 ANSWER 7 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 92:1131 TULSA
DOCUMENT NUMBER: 517222
TITLE: SLIMHOLE DRILLING : THE STORY SO FAR
AUTHOR: RANDOLPH, S; BOSIO, J; BOYINGTON, B
CORPORATE SOURCE: AMOCO PRODUCTION CO; ELF AQUITAINE; CONOCO (UK) LTD
SOURCE: OILFIELD REV V 3, NO 3, PP 46-54, JULY 1991 (ISSN 09231730;
22 REFS). ; Journal

LANGUAGE: English

AB Today, slimhole drilling falls into 2 distinct categories, each requiring its own drilling hardware. First, there are wells that are drilled using small bits. These tend to have diameters 6 in. (152 mm) to 4.5 in. (114 mm) and can be both exploration and production wells. The rigs for this are scaled-down versions of conventional equipment evolved from the oil field. Then, there is a continuous coring system borrowed from the mining industry. Wells drilled in this way are almost exclusively for exploration and have a diameter of as little as 3 in. (76 mm). Typical of the scaled-down, purpose-designed equipment is Microdrill AB's MD-5 Britta rig that drilled BP's Plungar field and more than 250 wells in Turkey, Tunisia and Europe. It has a 36- ft (11-m) mast compared with ca 130 ft (40 m) for a conventional land rig. Maximum drilling depth is 4,900 (1,500 m). Instead of a conventional kelly bushing, the system uses a hydraulic rotating torque head mounted on the mast. This allows simultaneous rotation and tripping of drill **pipe**. Mud is pumped into the string via a swivel above the torque head.

L2 ANSWER 8 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 91:21242 TULSA
DOCUMENT NUMBER: 515641
TITLE: CHARACTERIZATION OF SWIRLING FLOW AND ITS EFFECTS ON ORIFICE METERING
AUTHOR: SHEN, J J S
CORPORATE SOURCE: CHEVRON OIL FIELD RES CO
SOURCE: 66TH ANNU SPE TECH CONF (DALLAS, 10/6-9/91) PROC (PRODUCTION OPERATIONS & ENGINEERING) PT 2, PP 457-467, 1991 (SPE-22865; 19 REFS). ; Conference; Conference Article
LANGUAGE: English

AB The effects of swirling flow on the measurement accuracy of a 152-mm (6-in.) orifice meter are presented. The test was conducted in a low-pressure, air flow calibration facility with swirls generated by an axial vane-type swirler. The flow fields inside the orifice meter were characterized by a multiport pitot-static probe traversing across the meter run. The orifice meter performance was compared with reference critical flow nozzles. The salient features of the observed flow fields compared quite closely with swirling flows generated by 2 close, out-of-plane elbows reported in the literature. The axial velocity profile was shown to be generally flatter than the fully-developed one. The swirl angle measurements delineated a secondary flow pattern of solid-body rotation. Without a flow conditioner in the line, the orifice meter was found to undermeasure the true flow rate in a swirling flow. The deviation in flow measurements increased with increasing swirl angle. The tube bundle flow conditioner was very effective in removing swirls in the flow but not in rectifying the deficient axial velocity profile. Based on the collected swirling flow data, a method is proposed for estimating possible swirl-induced flow rate errors for orifice meters in field use.

L2 ANSWER 9 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 90:2286 TULSA
DOCUMENT NUMBER: 476623
TITLE: EFFECTS OF A SWIRLER ON ORIFICE METER FLOW MEASUREMENT
AUTHOR: SHEN, J J S
CORPORATE SOURCE: CHEVRON OIL FIELD RES CO
SOURCE: AICHE SPRING NAT MTG (HOUSTON, 4/2-6/89) PAP NO 51C 1989 (32 PP; 12 REFS). ; Conference; Conference Article
LANGUAGE: English

AB The effects of swirling flow, generated by an axial vane- type swirler, on the measurement accuracy of a 152-mm orifice meter are

presented in this paper. The test was conducted in a low-pressure air flow
calibration facility. The effects of the induced swirling flow were studied by comparing the orifice flow rates with that of critical flow nozzles which were installed downstream of the meter in the system. A swirler with 10 adjustable blades was designed and constructed as a convenient way to generate reproducible swirling flows of various intensities. The test data suggest that a tube-bundle flow conditioner would be quite useful in rectifying swirls in the flow for improved orifice meter measurement.

L2 ANSWER 10 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 89:10287 TULSA
DOCUMENT NUMBER: 462550
TITLE: ANNULAR FLOW (FLUJO ANULAR)
AUTHOR: ZUBILLAGA, V; GONZALEZ, J; GUEVARA, E; ZAGUSTIN, K
CORPORATE SOURCE: MARAVEN SA; INTEVEP
SOURCE: LATIN AMER HYDROCARBON CONGR (RIO DE JANEIRO, BRAZIL, 10/16-21/88) PAP; BOL TEC ARPEL V 17, NO 3, PP 197-204, SEPT 1988 (ISSN 02536005; IN SPANISH). ; Conference; Conference Article
LANGUAGE: Spanish
AB Since 1981, an investigation has been undertaken in Venezuela to transport
by **pipeline** very heavy crudes with viscosities of up to 110,000 cs by injecting small volumes of water, which forms a film between the **pipewall** and the crude. This results in a drastic pressure drop as proven in a test loop of 203 mm diameter by 1,000 m long. An operational procedure to startup after prolonged shutdown and a theoretical model of the process to predict pressure drops with reasonable accuracy have been developed. Recently a **pipeline** of **152.4 mm** diameter by 55 km has been installed to operate by this methodology.

L2 ANSWER 11 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 85:10741 TULSA
DOCUMENT NUMBER: 381920
TITLE: PULL OUT AND BENDING EXPERIMENTS IN BURIED **PIPES**
AUTHOR: SINGHAL, A C; BENAVIDES, J C
CORPORATE SOURCE: ARIZONA STATE UNIV
SOURCE: 4TH ASME NAT PRESSURE VESSEL & PIPING TECHNOL CONGR INT LIFELINE EARTHQUAKE ENG SYMP (PORTLAND, ORE, 6/19-24/83) PROC PP 294-303, 1983 (PVP-VOL 77) ("EARTHQUAKE BEHAVIOR AND SAFETY OF OIL AND GAS STORAGE FACILITIES, BURIED PIPELINES AND EQUIPMENT"). ; Conference; Conference Article
LANGUAGE: English
AB Experiments have been performed on 4-in. (101.6 mm), 6-in. (**152.4 mm**), 8-in. (203.2 mm), and 10-in. (254 mm) diameter **pipeline** joints to determine their structural behavior when subjected to static loading and reloading conditions. Joint pull-out and joint bending tests have been performed on ductile cast iron **pipes** with push-on rubber gaskets under buried, semi-buried, and unburied conditions. Tests have been performed to observe both the linear and nonlinear behavior of the joint, including large joint displacements and joint slippage. Graphs showing the pull-out force vs. joint displacement and bending moment vs. joint rotation are drawn, based on test data. An analysis of the data on joint pull-out tests shows a definite common pattern. The initial load- displacement curve is a straight line whose slope is the joint's stiffness. The subsequent load-displacement curve contains significant slippage up to the complete separation of the 2 **pipe** segments. (24 refs.)

L2 ANSWER 12 OF 13 TULSA COPYRIGHT 2000 UTULSA

ACCESSION NUMBER: 83:6686 TULSA
DOCUMENT NUMBER: 337379
TITLE: NORWEST-SOCEA'S PROJECT FOR BRITISH GAS CORP. IN SERVICE
SOURCE: PIPE LINE IND V 58, NO 2, PP 45-46, FEB 1983 (ISSN 00320145). ; Journal
LANGUAGE: English

AB Additional North Sea gas to reinforce SE. England's supplies now is moving through a new 1,067-mm (42-in.) transmission system, constructed for British Gas Corp. during a 3-yr period. The new major transmission system, starting in Scotland where North Sea lines make landfall, and extending south and east, is complete. Extensions of the main transmission line now are under construction, planned or proposed by British Gas Corp. Construction of these facilities will extend through 1985. Norwest-Socea, joint venture, one of the major contractors on the main 42-in. line, constructed 94 km (58 miles) through Northumberland. This project was installed in 2 sections, from Simprin to Wooler station and then to Corbridge. The project included 89.4 km (55.5 miles) of API grade 5LX-60 **pipe** in 12.7-mm (.500-in.) WT. This cross-country **pipeline** was coated with epoxy fusion bond material. An additional 4.6 km (2.8 miles) of the X-60 **pipeline**, in heavier wall thickness, was weighted with **152 mm** (6 in.) of concrete and used in stream crossings. The 42-in. line reinforces SE. England's gas supply from North Sea.

L2 ANSWER 13 OF 13 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:1219 TULSA
DOCUMENT NUMBER: 289991
TITLE: THE TRANSPORTATION OF CUBOID PARTICLES IN HORIZONTAL **PIPELINES**
AUTHOR: MCKAY, G; MCLAIN, H D
SOURCE: TRANS INST CHEM ENG V 58, NO 3, PP 175-180, JULY 1980 (ISSN 00469858). ; Journal
LANGUAGE: English

AB The hydraulic transportation of perspex cuboids of cross-sectional dimensions 12.5 mm x 12.5 mm and length 51 mm, 25 mm and 12 mm was investigated in **pipes** of diameter **152 mm** and 95 mm. The pressure gradient for delivered solids concentrations of 0.05 to 0.25 by vol, was found to be given by an equation. The constants were determined for all the particle sizes tested and the values have been shown to vary with both particle length and **pipe** diameter. The mode and quality of transportation was studied and critical flow velocities for minimum pressure loss were calculated. The operation of hydraulic transportation systems at the critical velocity can result in significant energy saving on industrial plants. (13 refs.)

?t 6/7

6/7/1 (Item 1 from file: 371)
000804070 **Image present**
Titre: PROCEDE ET APPAREIL POUR POSER UN TUBE-GUIDE DE FORAGE SOUS L'EAU
Deposant: DRILEX SYSTEMS INC
Nom et Adresse du Deposant: DRILEX SYSTEMS INC (US)
Nom Inventeurs: THOMAS F. **BAILEY**; JOHN E. CAMPBELL
Nom Mandataire: CABINET LAVOIX
Nature de Publication: Brevet
Information de Brevet et Priorites (Pays, Numero, Date):
Numero Publication: FR 2613763 - 19881014
Numero Depot: FR 884763 - 19880411
Priorites: US 8737818 - 19870413
Rapport de Recherche Preliminaire (Brevet/Reference, Code de Pertinence):
Rapport de Recherche
GB 2010360 A (Cat. X)
GB 2010360 A (Cat. Y)
US 4133396 A (Cat. Y)
US 3519071 A (Cat. A)
US 4593937 A (Cat. A)
US 3628604 A (Cat. A)
US 4474243 A (Cat. A)
US 3782460 A (Cat. A)
GB 1249440 A (Cat. A)
US 3621910 A (Cat. A,D)

Resume:
CET APPAREIL COMPREND UN TUBE-GUIDE 10 AYANT UN CARTER DE TETE 12 A SON EXTREMITE SUPERIEURE ET UN DISPOSITIF DE VERROUILLAGE ANNULAIRE 32 COMPORTANT UN TRAIN DE TIGES 18 QUI LE TRAVERSE, CE BOITIER 32 COMPORTANT DES MOYENS CONSTITUES PAR DES BROCHES RETRACTABLES 70 S'ETENDANT RADIALEMENT VERS L'EXTERIEUR POUR LE FIXER DE FACON AMOVIBLE DANS LEDIT CARTER 12 DE TETE ET DES MOYENS CONSTITUES PAR DES BROCHES RETRACTABLES 72 S'ETENDANT RADIALEMENT VERS L'INTERIEUR POUR FIXER LEDIT TRAIN DE TIGES 18 DE FACON REGLABLE DANS LE DISPOSITIF DE VERROUILLAGE 32.

Classification Internationale (Principale): E21B-007/12
Classification Internationale: E21B-007/20

Descripteurs Francais: FORAGE SOUSMARIN; TUBE GUIDE; PUITS; MISE EN PLACE; TRAIN DE TIGES; VERROUILLAGE
Descripteurs Anglais: SUBSEA DRILLING; GUIDE TUBE; CONDUCTOR PIPE; WELL; SETTING; **DRILL** **PIPE** STRING; LOCKING

Forme Juridique (Type, Date de l'action, No. de BOPI, Description):

Publication	19881014	8841	Date de publication
Rapp de Rech	19900803	9031	Date de Rapport de Recherche
Decheance	19911230		Date de decheance

?

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show files;ds;t 18/7/all
File 344:Chinese Patents ABS Apr 1985-2000/Feb
         (c) 2000 European Patent Office
File 347:JAPIO Oct 1976-2000/Jan(UPDATED 000611)
         (c) 2000 JPO & JAPIO
File 351:DERWENT WPI 1963-2000/UD=, UM=, & UP=200029
         (c) 2000 Derwent Info Ltd
File 371:French Patents 1961-2000/BOPI 0023
         (c) 2000 INPI.  All rts. reserv.

Set     Items   Description
S1         79   AU="PAYNE"
S2         21   AU="PAYNE M"
S3        173   AU="SMITH J"
S4        109   AU="BAILEY"
S5         53   AU="BAILEY E":AU="BAILEY E R"
S6          1   (S1 OR S2 OR S3 OR S4 OR S5) AND DRILL()PIPE?
S7      14347   PIPE(2N)JOINT OR PIPE(2N)FITTING OR TUBING(2N)JOINT
S8       2802   DRILL(2N)PIPE?
S9       4428   DRILL?(2N)(PIPING OR PIPE?)
S10       181   DRILL?(2N)TUBING
S11       157   DIAMETER(3N)(6 OR SIX)(2N)INCH?
S12      9303   DIAMETER?(3N)(6 OR SIX)
S13      7370   DIAMETER?(3N)(7 OR SEVEN)
S14         0   S7 AND (S9 OR S10) AND (S12 AND S13)
S15         0   S7 AND (S9 OR S10) AND (S12 OR S13)
S16       199   S7 AND (S9 OR S10)
S17    442429   DIAMETER?
S18        13   S7(5N)S9 AND S17
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18/7/1 (Item 1 from file: 351)

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DIALOG(R)File 351:DERWENT WPI
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012561927    **Image available**
WPI Acc No: 1999-368033/199931
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Rotary excavation method using low viscous fluid for underground disposal of high level radioactive waste - involves setting the **drill **pipe** **joint** and **drill** collar with specific **diameter** difference so as to maintain minimum rising speed of drill pipe**

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Patent Assignee: TEISEKI SAKUI KOGYO KK (TEIS-N)
Number of Countries: 001  Number of Patents: 001
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date     Week
JP 11141265    A   19990525  JP 97317756     A   19971105  199931  B

Priority Applications (No Type Date): JP 97317756 A 19971105
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
JP 11141265   A      7 E21B-021/08

Abstract (Basic): JP 11141265 A
        NOVELTY - The difference in **diameter** of the joint of a drill
    pipe (12) and the outer **diameter** of drill collar (13) is less than
    or equal to 13.5 mm so that the rising speed of the drill pipe is
    minimum for removal of excavated material. The low viscous fluid flows
    through annular clearance (16) formed between the drill pipe and the
    casing (15).
        USE - For underground disposal of high level radioactive waste.
        ADVANTAGE - Deeper pits are excavated because of the accuracy in
    dimension of drill pipe.
        DESCRIPTION OF DRAWING - The figures show side view of conventional
    rotary excavating construction method and the low viscous fluid rotary
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excavating method. (12) Drill pipe; (13) Drill collar; (15) Casing; (16) Clearance.
Dwg.1/2
Derwent Class: K07; Q49
International Patent Class (Main): E21B-021/08

18/7/2 (Item 2 from file: 351)
DIALOG(R)File 351:DERWENT WPI

011124032 **Image available**
WPI Acc No: 1997-101956/199710
****Pipe** **drilling** **fitting** with drill guide - has drill shaft possessing variable external **diameters** along length of external thread**
Patent Assignee: WAVIN BV (WAVI)
Inventor: AMACHER U
Number of Countries: 018 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 756128	A1	19970129	EP 96810409	A	19960619	199710	B

Priority Applications (No Type Date): CH 952190 A 19950726
Cited Patents: DE 2051702; US 3995655; WO 9516874
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 756128	A1	G	9	F16L-047/00	

Designated States (Regional): AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Abstract (Basic): EP 756128 A
The drill (5) can be rotated and axially moved in its guide piece (1). It has a drill bit (52) and a single or multiple part, externally threaded (51) shaft (50). An internal thread (11) in the guide piece engages with the external thread.
The drill shaft has varying external **diameters** over the length of the external thread. The maximum external thread is greater than the internal **diameter** of the drill guide piece. The widest **diameter** part at least of the shaft is deformable to form a seal.
ADVANTAGE - The fitting requires no sealing rings yet guarantees a tight seal, by the larger outer **diameter** part pressing radially into the inner thread, thereby elastically deforming the outer thread to form a sealed area.
Dwg.1/7
Derwent Class: Q67
International Patent Class (Main): F16L-047/00

18/7/3 (Item 3 from file: 351)
DIALOG(R)File 351:DERWENT WPI

010437609 **Image available**
WPI Acc No: 1995-338926/199544
Drill pipe protector providing vibration suppression - comprising tubular rubber member having inner and outside dias. equal and an outside surface with a pattern of intercommunicating raised areas.
Patent Assignee: HYDRIL CO (HYDL)
Inventor: CARLSON D W; SIMONS S P
Number of Countries: 004 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week

GB 2288198	A	19951011	GB 957307	A	19950407	199544	B
DE 19513232	A1	19951012	DE 1013232	A	19950407	199546	
FR 2718487	A1	19951013	FR 954160	A	19950407	199546	
US 5542454	A	19960806	US 94224753	A	19940408	199637	
GB 2288198	B	19971203	GB 957307	A	19950407	199751	

Priority Applications (No Type Date): US 94224753 A 19940408
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
GB 2288198	A		17	E21B-017/10	
DE 19513232	A1		8	E21B-017/10	
FR 2718487	A1		14	E21B-017/10	
US 5542454	A		7	F16L-057/00	
GB 2288198	B			E21B-017/10	

Abstract (Basic): GB 2288198 A

Pipe protector (10) has a tubular rubber member sized to a preselected inner dia. which is approximately the outside dia. of the pipe (12). The member has a pattern of raised surfaces (20) surrounded by communicating channels (14) on its outside surface, the pattern being bilaterally asymmetric when the pattern on the top half of it is compared with the pattern on the bottom half.

USE - Protector is used to surround drill pipe in downhole drilling operations and contacts the metal casing into which the pipe is introduced.

ADVANTAGE - The protector provides the benefits of sufficient surface area for good wear characteristics and channels for fluid flow with low rotational energy requirements and vibration suppression.

Dwg.1/5

Abstract (Equivalent): GB 2288198 B

A pipe protector comprising: a tubular rubber member sized to a preselected inner **diameter** to approximate outside **diameter** of a pipe; a pattern in the outside surface of the tubular rubber member of integral raised surfaces of rubber surrounded by a plurality of pairs of communicating channels in the outer surface of the rubber member through which drilling fluid can bypass the protector; the pairs of communicating channels starting at equally spaced points around the lower edge of the outside surface and extending upwardly at the same angle from the plane of the longitudinal axis of the protector along divergent paths so that the channels intersect and leave a pattern of diamond-shaped raised surfaces to engage the wall of the casing while drilling fluid flows past the protector through the channels; and said pattern being bilaterally asymmetrical when comparing the pattern on the approximate top half of the pipe protector to the pattern of the approximate bottom half.

Dwg.1

Abstract (Equivalent): US 5542454 A

A pipe protector comprising: (a) a tubular rubber member for installing on a **joint** of **drill** **pipe** for rotation with it within a well casing; and (b) a pattern formed in the outside surface of the tubular rubber member of integral raised surfaces of rubber surrounded by a number of pairs of communicating channels in the outer surface of the rubber member through which drilling fluid can bypass the protector. The pairs of communicating channels start at equally spaced points around the lower edge of the outside surface and extend upwardly at the same angle from the plane of the longitudinal axis of the protector along divergent paths so that the channels intersect and leave a pattern of diamond-shaped raised surfaces to engage the wall of the casing while drilling fluid flows past the protector through the channels. The pattern is bilaterally asymmetrical when comparing the pattern on the approximate top half of the pipe protector to the pattern of the approximate bottom half.

Dwg.1/5

Derwent Class: H01; Q49; Q67
International Patent Class (Main): E21B-017/10; F16L-057/00

18/7/4 (Item 4 from file: 351)
DIALOG(R)File 351:DERWENT WPI

010322080 **Image available**
WPI Acc No: 1995-223353/199529
Direction controllable sub-surface borehole tool - used for horizontal borehole drilling to install connection lines, such as optical cables, across a highway right-of-way
Patent Assignee: HALE R G (HALE-I)
Inventor: HALE R G
Number of Countries: 019 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5423388	A	19950613	US 94287449	A	19940808	199529	B
WO 9605402	A1	19960222	WO 95US6681	A	19950526	199614	
MX 9601309	A1	19981101	MX 961309	A	19960408	200022	

Priority Applications (No Type Date): US 94287449 A 19940808
Cited Patents: US 1636032; US 3961674; US 4076084; US 5052502
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5423388	A		5	E21B-007/06	
WO 9605402	A1	E	12	E21B-007/06	
Designated States (National): CA DE MX					
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE					
MX 9601309	A1			E21B-007/06	

Abstract (Basic): US 5423388 A

A direction controllable drilling head for forming a borehole along a preselected underground path, comprises: (a) elongated tubular body (22), with forward and rearward ends, and upper periphery, adapted for axial connection at rearward end with one end of length of casing and longitudinally moved by casing in a borehole; (b) sleeve bearing (36) with outer periphery in the body and longitudinally movable relative to the body; (c) co-operating pair of superposed wedges (28,29,30,31) interposed in diametric opposition between inner periphery of body and outer periphery of sleeve bearing at respective end portions of the latter for normally concentrically supporting sleeve bearing in body; (d) rotary **drill** **pipe** sub-**joint** adapted for connection at one end with rotary drill string (38) having a drill bit (40), of, at least, slightly larger **diameter** than body, on its other end projecting beyond forward end of body; (e) sub-joint journalled by sleeve bearing and longitudinally movable with sleeve bearing relative to body; (f) longitudinal movement of sleeve bearing and sub-joint, relative to body in borehole forming direction, moves one wedge of pairs of wedges, relative to other wedge of respective pair, and changes longitudinal axes of sleeve bearing and sub-joint to a predetermined angle and in a preselected direction relative to longitudinal axis of body.

USE - A direction controllable earth boring tool capable of crossing a highway where the surface of the earth, on either side, is substantially equal to the elevation of the roadway.

ADVANTAGE - The drill may be oriented in an upward direction by interrupting forward movement of the casing and moving drill string and drill bit forward relative to casing.

Dwg.2/4
Derwent Class: H01; Q49

International Patent Class (Main): E21B-007/06

18/7/5 (Item 5 from file: 351)
DIALOG(R)File 351:DERWENT WPI

010073008 **Image available**
WPI Acc No: 1994-340721/199442
****Joint** of **drill** **pipe** with stress relief groove - which is in weld neck to increase fatigue life of tube section with upset ends to increase wall thickness**
Patent Assignee: PRIDECO INC (PRID-N)
Inventor: WILSON G E
Number of Countries: 009 Number of Patents: 011
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5358285	A	19941025	US 92985832	A	19921203	199442	B
			US 94182211	A	19940113		
GB 2285645	A	19950719	GB 9418623	A	19940915	199532	
FR 2714932	A1	19950713	FR 9412148	A	19941012	199533	
DE 4437953	A1	19950720	DE 4437953	A	19941024	199534	
CA 2128114	A	19950714	CA 2128114	A	19940715	199540	
JP 7214210	A	19950815	JP 94226294	A	19940921	199541	
BR 9403970	A	19951017	BR 943970	A	19941004	199550	
GB 2285645	B	19970514	GB 9418623	A	19940915	199722	
HU 70819	T	19951128	HU 942552	A	19940905	199733	
IT 1268847	B	19970313	IT 94RE87	A	19941024	199740	
CA 2128114	C	19981124	CA 2128114	A	19940715	199906	

Priority Applications (No Type Date): US 94182211 A 19940113; US 92985832 A 19921203
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5358285	A		12	F16L-013/04	CIP of application US 92985832 CIP of patent US 5286069
GB 2285645	A		31	E21B-017/00	
DE 4437953	A1		20	E21B-017/02	
JP 7214210	A		13	B21D-051/16	
FR 2714932	A1			E21B-017/042	
CA 2128114	A			E21B-017/02	
BR 9403970	A			E21B-017/02	
GB 2285645	B			E21B-017/00	
HU 70819	T			E21B-017/042	
IT 1268847	B			E21B-000/00	
CA 2128114	C			E21B-017/02	

Abstract (Basic): US 5358285 A

The **joint** of **drill** **pipe**, has a tube section with upset ends to increase the wall thickness of the tube at its ends and tool joints connected to each end of the tube. Each tool joint has a cylindrical section connected to a weld neck of **diameter** by a tapered section. The connection between the tapered section and the weld neck has a radius of curvature and the weld neck has a wall thickness equal to that of the upset end of the tube that is welded to the weld neck.

An external, stress relief groove is located in the weld neck to increase the fatigue life of the tube section of the drill pipe when the drill pipe is subjected to varying stresses produced by rotating the drill pipe while bent. One end of the relief groove is arcuate and is an extension of the radius of curvature between the tapered section and the weld neck. The groove may be arcuate in cross-section or it may have arcuate end sections with a cylindrical section between the end

sections.
Dwg.4/9
Abstract (Equivalent): GB 2285645 B
In a **joint** of **drill** **pipe** having a tube section with upset ends to increase the wall thickness of the tube at its ends and tool joints connected to each end of the tube, each tool joint having a cylindrical section connected to a weld neck of smaller **diameter** by a tapered section, said connection between the tapered section and the weld neck having a radius of curvature, said weld beck having a wall thickness equal to that of the upset end of the tube that is welded to the weld neck, the improvement comprising an external, stress relief groove in the weld neck to increase the fatigue life of the tube section of the drill pipe when the drill pipe is subjected to varying stresses produced by rotating the drill pipe while bent, one end of the relief groove being arcuate and an extension of the radius of curvature between the tapered section and the weld neck.
Dwg.1
Derwent Class: P52; Q49; Q67
International Patent Class (Main): B21D-051/16; E21B-000/00; E21B-017/00; E21B-017/02; E21B-017/042; F16L-013/04
International Patent Class (Additional): B21K-021/12; F16L-013/02

18/7/6 (Item 6 from file: 351)
DIALOG(R)File 351:DERWENT WPI

004540488
WPI Acc No: 1986-043832/198607
Connection for drill column - has larger-diameter** intermediate portion with inserts containing nozzles facing upwards from central bore**
Patent Assignee: CIE FR PETROLES SA (PETF); TOTAL CIE FR PETROLES SA (PETF)
Inventor: DORLEANS A; FERMAUD G
Number of Countries: 013 Number of Patents: 010
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 171335	A	19860212	EP 85401608	A	19850807	198607	B
GB 2162881	A	19860212	GB 8518104	A	19850718	198607	
FR 2568935	A	19860214				198613	
AU 8545698	A	19860213				198614	
NO 8503118	A	19860303				198616	
US 4583603	A	19860422	US 85758258	A	19850724	198619	
GB 2162881	B	19871118				198746	
EP 171335	B	19880323				198812	
DE 3561962	G	19880428				198818	
CA 1241944	A	19880913				198841	

Priority Applications (No Type Date): FR 8412510 A 19840808
Cited Patents: FR 2417002; GB 2096210; GB 2127466; US 2765146; US 3566980
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 171335	A	F	12		

Designated States (Regional): BE CH DE IT LI NL SE

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 171335	B	F			

Designated States (Regional): BE CH DE IT LI NL SE

Abstract (Basic): EP 171335 B
The drill column connection comprises a rectangular vertical body with an axial bore and threaded end portions (6,7) for insertion in the column. Passages extend upwards to the outside from the interior.
Between the cylindrical ends (2,3) is a larger-**diameter** cylindrical portion (4) with a top face (11) for connection to the top end (2), containing three or more recesses (12) evenly spaced round the

periphery and extending to the axial bore. Each recess accommodates an insert (15) containing a passage (21) from the bore extending from the bottom to the top. At the upper end of each passage is a vertical nozzle (23) on a pitch circle between the outside of the intermediate portion and that of the top portion.

USE - When drilling through a circulation-loss zone, avoiding destructive action on the walls of the well. (12pp Dwg.No.1/3

Abstract (Equivalent): EP 171335 B

A drilling rod joint comprising a body (1) elongated on a vertical axis, internally provided with an axial bore (5) and externally forming upper (2) and lower (3) cylindrical end portions provided at their free ends with screw connection means (6,7) for connection of the joint in a drill string, and comprising upwardly directed passages extending from inside of the drill string to outside thereof, characterised in that said elongated body (1) comprises between said cylindrical end portions (2,3) an intermediate widened cylindrical portion (4) whose outside **diameter** is greater than the outside **diameter** of said upper cylindrical end portion (2), which has an upper face (11) for connection to the upper cylindrical end portion and which is provided with at least three cutouts (12,13,14) each of which extends into said upper face (11) and to said axial bore (5), and which are regularly distributed circumferentially relative to one another and in that each of these cutouts (12,13,14) has inserted into it an attached member (15,16,17) provided with an upwardly directed internal passage (21) opening at its lower end (22) into said bore (5) and ending at its upper end vertically in a nozzle (23) which is situated on a **diameter** intermediate the ouside **diameter** of said intermediate portion (4) and the outside **diameter** of said upper portion (2). (8pp)

Abstract (Equivalent): GB 2162881 B

A **drill** **pipe** **joint** comprising a body elongated on a vertical axis, provided internally with an axial bore, and comprising upper and lower generally cylindrical end portions provided at their free ends with screw connection means for connection of the joint in a drill pipe, and an intermediate widened portion whose outside **diameter** is greater than the outside **diameter** of the upper portion, thus providing an upper face at its connection to the upper portion, wherein the intermediate portion is provided with at least three cutouts, each of which extends into the upper face and to said axial bore and which are regularly distributed circumferentially relative to one another, and each of the cutouts has inserted into it an attached member provided with an upwardly directed internal passage opening at its lower end into said bore and ending at its upper end in a nozzle which is situated on a **diameter** intermediate the outside **diameter** of said intermediate portion and the outside **diameter** of said upper portion.w

Abstract (Equivalent): US 4583603 A

The **drill** **pipe** **joint** has a body elongated on a vertical axis, provided internally with an axial bore. It comprises upper and lower cylindrical end portions provided at their free ends with screw connector for connection of the joint into a drill pipe. An intermediate widened portion whose outside **diameter** is greater than the outside **diameter** of the upper portion has an upper face at its connection to the upper portion. The intermediate portion is provided with at least three cutouts.

Each of the cut-outs cuts into the upper face and extends to the axial bore and are regularly distributed circumferentially relative to one another. Attached pieces each inserted into a respective cutout. Each attached piece defines an upwardly directed internal passage opening at the lower end into the bore and provided at the upper end with a nozzle. It is situated on a dia. between the outside dia. of the intermediate portion and the outside dia. of the upper portion.

USE - For drilling a well through a zone where circulation has been

lost. (6pp
Derwent Class: Q49; Q67
International Patent Class (Additional): E21B-017/10; E21B-021/00; F16L-055/00

18/7/7 (Item 7 from file: 351)
DIALOG(R)File 351:DERWENT WPI

003999265
WPI Acc No: 1984-144807/198423
Drill pipe protector with ring elements - has washers at ends of inner ring backed by body frame tails to clamp protector firmly to drill pipe
Patent Assignee: SHIPOVSKII I YA (SHIP-I)
Inventor: MASHKOV A V; SHIPOVSKII I Y A; SMIRNOV Y U P
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 1041667	A	19830915	SU 3415783	A	19820405	198423	B

Priority Applications (No Type Date): SU 3415783 A 19820405
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 1041667	A		2		

Abstract (Basic): SU 1041667 A
The protector comprises a metal frame and inside flexible ring component and an outer flexible ring joined to the frame. To ensure that the protector is firmly fitted to the protected pipe, it is fitted with clamping washers (5) at the ends of the inner ring (1). The metal frame (4) itself has tails (6) to work with these same washers, the frame **diameter** being preferably greater than the **drill** **pipe** **joint** (3). This enables the inner ring to be re-used.
Bul.34/15.9.83.
(2pp Dwg.No.1/1
Derwent Class: H01; Q49
International Patent Class (Additional): E21B-017/10

18/7/8 (Item 8 from file: 351)
DIALOG(R)File 351:DERWENT WPI

003731067
WPI Acc No: 1983-727265/198331
****Drill** **pipe** **joint** with torque limiter - as insert positioned between pin and box joint surfaces and with specified dia. for easy release of stuck pipe**
Patent Assignee: TURK PETRO IND (TUPE-R)
Inventor: BEDNYI V I; PAKHMURIN G A
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 960419	A	19820923				198331	B

Priority Applications (No Type Date): SU 3234795 A 19810112
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 960419	A		3		

Abstract (Basic): SU 960419 A
The joint is fitted with a torque limiter insert arranged between

the pin and box endfaces. In a simpler design which avoids any loss of joint stiffness, the insert (3) presents a cylindrical pin. The joining surfaces of the joint pin and box (8,9), together form a space for the limit pin (3). The dia. of the insert pin should be a multiple of the thread pitch joining the pin and box comprising the pipe joint. Bul. 35/23.9.82. (3pp Dwg. No. 1,2/2)
Derwent Class: H01; Q49
International Patent Class (Additional): E21B-017/04

18/7/9 (Item 9 from file: 351)
DIALOG(R)File 351:DERWENT WPI

003707966
WPI Acc No: 1983-704148/198327
Running tool for drill pipe on cable - has sleeve on slings over elevator and cable tip with loop to transfer cable weight
Patent Assignee: NW SIBE GEO-PROSPEC (NWSI-R)
Inventor: KHAIRULLIN B Y U
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 953185	A	19820823				198327	B

Priority Applications (No Type Date): SU 3238951 A 19810122
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 953185	A		5		

Abstract (Basic): SU 953185 A
The tool consists of an elevator, sling fitted clamp, fork, bayonet fastener and weight secured to one end of the cable as led over a pulley to the draw-works. To ease pipe lowering under these conditions, the tool has a sleeve (9) fixed to the slings (8) above the elevator (7) at more than one **drill** **pipe** **joint** distance. The sleeve orifice should equal the inside **diameter** of the pipe being run and be coaxial to the elevator entry.
The cable from downhole (10) has a tip (11) formed from a loop (16) and thimble body enclosing sprung stops (19,21) to work with the sleeve (9) after the cable has been drawn through the pipes being lowered into the hole. This transfers the cable weight to the slings so that the pipe (6) hung in the elevator is held steady for screwing up (14) etc. as required. Bul.31/23.8.82
(5pp Dwg.No 1,2/9
Derwent Class: H01; Q49
International Patent Class (Additional): E21B-031/00

18/7/10 (Item 10 from file: 351)
DIALOG(R)File 351:DERWENT WPI

003287747
WPI Acc No: 1982-D5758E/198213
Auxiliary **fitting for **drilling** **pipe** under pressure - comprises outer pipe with internal collar and coaxial inner one**
Patent Assignee: WAVIN NV (WAVI)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
NL 8004433	A	19820301				198213	B

Priority Applications (No Type Date): NL 804433 A 19800804
Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
NL 8004433 A 10

Abstract (Basic): NL 8004433 A
The auxiliary fitting is for use with a length of pipe having an outer edge of larger **diameter**. It comprises two pipes (10,11) fitting coaxially one inside the other, the outer one having an internal collar (12) and the inner one a pressure face acting against a seal (14) of soft material bearing against the collar.
The internal dia. of the collar and of the inner pipe is slightly greater than the external dia. of the pipe edge (6) and the two pipes can be thrust axially in relation to each other, so as to force the seal behind the edge.
1
Derwent Class: Q67
International Patent Class (Additional): F16L-041/04

18/7/11 (Item 11 from file: 351)
DIALOG(R)File 351:DERWENT WPI

002171418
WPI Acc No: 1979-K1366B/197943
Drill rod clamp with cylinder - uses rocking sleeve with chamfered ends connected to sprung foot with hard metal plate end
Patent Assignee: KONOVALOV L P (KONO-I)
Inventor: MIRGORODSK V D
Number of Countries: 001 Number of Patents: 001
Patent Family:
Patent No Kind Date Applicat No Kind Date Week
SU 643635 A 19790125 197943 B

Priority Applications (No Type Date): SU 1798231 A 19720619

Abstract (Basic): SU 643635 A
The clamp composed of feed cylinder and associated rod has been adapted to allow smooth passage of the rod joints through the clamp. The clamp now comprises a rocking sleeve (1) acting as guide, having chamfered ends (4) and connected to the rod (8) of the cylinder via a sprung (12) press down foot (5) whose active end is curved and armoured in hardmetal (13) plates at different radii away from its axis (6) so as to clamp the rod or joint regardless of their **diameter**.
The drill pipe (10) is passed through the sleeve, cylinder (9) energised so that the rod (8) shifts the clamp left. The foot acts via its hardmetal plates on the **drill** **pipe** or **joint** to force this to the bottom wall of the sleeve and thus move with the pipe by one full cylinder rod stroke. The medium is now reversed to retract rod and clamp, this now sliding along the pipe via the chamfered ends which enable it to slide over pipe joints
Derwent Class: Q49
International Patent Class (Additional): E21B-019/07; E21C-009/00

18/7/12 (Item 12 from file: 351)
DIALOG(R)File 351:DERWENT WPI

002053704
WPI Acc No: 1978-66765A/197837
Large dia. **drill **pipe** **joint** - has two sections with tongues**

and grooves which transmit torque between drill pipe sections
Patent Assignee: COBBS J H (COBB-I)
Inventor: COBBS J H
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4099745	A	19780711				197837	B

Priority Applications (No Type Date): US 77784288 A 19770404

Abstract (Basic): US 4099745 A

A rotory **drill** **pipe** tool **joint**, for use with large dia. **drill** **pipe**, has a pin and a box section each attached to opposing pipe ends at a joint, straight threaded second ends of the pin and box sections contg. longitudinal tongues and grooves to cooperate with each other so that the sections will fit together only in one angular position. A cylindrical extension on the pin section second end seals in a socket on the box section second end and a threaded collar couples the sections by screwing over the threaded meshed tongues.

The joint transmits torgue from one pipe to another, without screw thread tightening, by means of longitudinal tongues and grooves provides tensile strength and also seals adjacent drill pipes

Derwent Class: H01; Q67
International Patent Class (Additional): F16L-035/00

18/7/13 (Item 13 from file: 351)
DIALOG(R)File 351:DERWENT WPI

001171752
WPI Acc No: 1974-45588V/197425
Collarless **drill **pipe** **joint** - has acme thread with effective centre line angularly offset relative to taper thread**
Patent Assignee: MANNESMANN ROEHREN WERKE AG (MANS)
Number of Countries: 001 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2260416	A	19740612				197425	B
DE 2260416	B	19770623				197726	

Priority Applications (No Type Date): DE 2260416 A 19721207

Abstract (Basic): DE 2260416 A

A collarless joint for drill pipes uses an acme screw thread on the spigot and socket parts, both of which retain the original wall thickness. The centre line of the effective thread **diameters** deviates from that of a taper thread in that there is a continuous partial offsetting of that line in the direction of the other mating part. The inclined tooth flank of the spigot part has a concave shape and cooperates with a convex shape on the flank of the socket part.

Derwent Class: H01; Q49
International Patent Class (Additional): E21B-017/02
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     (FILE 'HOME' ENTERED AT 11:05:56 ON 26 JUN 2000)

     FILE 'TULSA' ENTERED AT 11:06:11 ON 26 JUN 2000
L1          7628 S DRILL(2A)PIPE OR DRILLPIPE
L2          9043 S PIPE(2A)(JOINT OR FITTING)
L3         24657 S (6 OR SIX)
L4         17940 S 7 OR SEVEN
L5             7 S L1 AND L2 AND L3 AND L4
L6             0 S (SEVEN OR 7)(2A)IN.
L7             1 S (SEVEN OR 7)(2A)IN
L8           327 S L1 AND L3
L9            17 S L1(3A)L3
L10          860 S INCH? OR IN
L11            0 S L9(5A)L10

=> d ibib abs l9 1-17


L9   ANSWER 1 OF 17  TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER:    2000:13394  TULSA
DOCUMENT NUMBER:     729998
TITLE:               INVESTIGATION OF WEAR AND TEAR OF DRILLING PIPE OUTSIDE
                     SURFACES
AUTHOR:              YANISHEVSKIY, A YA
SOURCE:              NAFT GAZ PROM NO 5, PP 27-29, SEPT-OCT 1999 (ISSN
05481414;
                     6 REFS; IN UKRAINIAN). ; Journal
LANGUAGE:            Ukrainian
AB   Results of investigation of wear and tear of drill pipe outside surfaces
     are described. An empirical relationship between mass wear of
     drill pipe and 6 initial factors are
     presented. The formula can be used for development of methods of
     forecasting drill string wear resistance.

L9   ANSWER 2 OF 17  TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER:    2000:11072  TULSA
DOCUMENT NUMBER:     727676
TITLE:               CASE HISTORY OF IMPLEMENTING NEW AND EXISTING TECHNOLOGY
TO
                     INCREASE THE LIFE OF DRILL STRINGS IN THE MIDDLE EAST
AUTHOR:              SCHWENKER, R; KYAW, H; MURPHY, P; SNAPP, D
CORPORATE SOURCE:    KUWAIT SANTA FE CO; NAT DRILL CO ABU DHABI; GRANT PRIDECO
SOURCE:              IADC ET AL MIDDLE EAST DRILLING CONF (DUBAI, UAE,
                     11/3-4/1998) PROC PAP NO 12, 1998 (8 PP). ; Conference;
                     Conference Article
LANGUAGE:            English
AB   As the technology for drilling wells in the Middle East and throughout
the
     world has become more demanding on the drill string (horizontal and
deeper
     wells, and harsh and corrosive environments), manufacturers have been
     working to improve the technology of the drill string. This presentation
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is a case history of how new and existing technology was implemented to combat the drill string failures that were occurring in Abu Dhabi and in Kuwait. New lengths of measurable internal upset for drill pipe combined with controlled yield grades have increased the life of the **drill pipe** to **6** to 7 yr from 3 to 4 yr historically. To reduce bottom-hole assembly failures in Kuwait, 6-5/8-in. OD Heavyweight **drill pipe** was used. **Six** years of case history show this technology has achieved the reduction of failures in these 2 cases.

L9 ANSWER 3 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 2000:5193 TULSA
DOCUMENT NUMBER: 721797
TITLE: NEW DEVELOPMENTS IN THE MECHANIZED RUNNING OF TUBULARS
AUTHOR: HARRIS, D; PEYON, A
CORPORATE SOURCE: SCHLUMBERGER
SOURCE: SPE/IADC MIDDLE EAST DRILLING TECHNOL CONF (ABU DHABI, UAE,
11/8-10/1999) PROC PP 363-371, 1999 (SPE/IADC-57589; 3 REFS). ; Conference; Conference Article
LANGUAGE: English
AB With the advent of a new generation of super drilling rigs, including fifth generation semisubmersibles, special needs have arisen for casing, tubing and drill pipe makeup and running. The power frame runs on rails similar to the hydraulic roughneck and is capable of suspending any power tongs to run casing and tubing in the range 3.5 in. to 20 in. and **drill pipe** up to **6**-5/8 in. Mechanized casing and tubing tongs come complete with free floating hydraulic backups and remote operation capabilities. Software simulates traditional PLC (programable logic controller) systems, and Profibus Communication Links provide remote operation of the power tongs and power tong frames. A plan for fully automated sequencing is implemented in the system. Mechanized drill pipe tongs run special drill pipe and drill pipe test risers. Circulating heads are designed for remote operation and for use with side door elevators. Special issues are addressed, such as the running of casing in triples.

L9 ANSWER 4 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 2000:4022 TULSA
DOCUMENT NUMBER: 720626
TITLE: NEW DRILL PIPE SIZE IMPROVES ERD (EXTENDED REACH DRILLING) AND DEEPWATER DRILLING
AUTHOR: JELLISON, M J; PAYNE, M
CORPORATE SOURCE: GRANT PRIDECO; ARCO TECHNOL & OPER SERV
SOURCE: WORLD OIL V 221, NO 1, PP 113-114,116,118,120, JAN 2000 (ISSN 00438790; COLOR; 2 REFS). ; Journal
LANGUAGE: English
AB A new product, 5-7/8-in. eXtreme Reach (XR) drill pipe, represents enabling technology for ERD, deep-water and other deep well applications. The hydraulic performance of the drill string can be a significant limitation in these applications, resulting in poor hole cleaning, slower penetration rates, diminished control over well trajectory and drill pipe sticking. The 5-7/8-in. XR provides a significant improvement in hydraulic efficiency compared to 5.5-in. drill pipe and does not suffer from the disadvantages associated with use of **6**-5/8-in. **drill pipe**. Realizing the full potential of 5-7/8 in. required development of a high-performance tool joint connection. The eXtreme Torque (XT) connection design, optimized for 5-7/8-in. drill pipe, provides exceptional torsional strength combined with a streamline configuration. The XT57 tool joint OD of 7 in. permits fishing of the connection with an overshot inside 9-5/8-in. casing or 8.5-in. openhole sections. This article discusses the engineering philosophy behind 5-7/8-in. XR drill pipe, and design challenges associated with development

of the product, and it reviews features and capabilities of the new connection. An upcoming project that will use 5-7/8 in. is also discussed.

The project, operated by ARCO China Inc. in the South China Sea, is scheduled to begin in early 2000.

L9 ANSWER 5 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 1999:12219 TULSA
DOCUMENT NUMBER: 701420
TITLE: CASE HISTORY: UTILIZING 5-1/2" DRILL PIPE IN A DEEPWATER GULF OF MEXICO DRILLING PROGRAM
AUTHOR: JENKINS, R W; GREENIP, J F; ADAMS, B A
CORPORATE SOURCE: TEXACO EXPLOR & PROD INC; HYDRIL CO; OIL & GAS RENTAL SERV INC
SOURCE: SPE/IADC DRILLING CONF (AMSTERDAM, NETH, 3/9-11/1999) PROC V 1, PP 79-87, 1999 (SPE/IADC-52769; 1 REF). ; Conference; Conference Article
LANGUAGE: English
AB A string of 5.5-in. drill pipe with special reduced-clearance outside-diameter tool joints is described for a long-term deep-water Gulf of Mexico drilling program. Actual field data including hydraulic analysis, fishing considerations, trip-speed, and completion uses are chronicled. The paper also discusses using the string of drill pipe to drill inside a 9-5/8-in. drilling liner, along with tieback and completions inside 9-5/8-in. production casing. Savings associated with using one string of drill pipe are presented. Inspection results and all damages are discussed. A comparison of drilling loads, drilling hydraulics and completion hydraulics is made on this string of specialty 5.5-in. drill pipe vs. standard 5-in. drill pipe, along with a limited comparison to **6**-5/8-in. **drill pipe**. Running and handling aspects are analyzed and discussed. A specific well that utilized this string of 5.5-in. drill pipe was drilled to below 27,500-ft MD (25,600-ft TVD) and is described as the example case for the program.

L9 ANSWER 6 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 1998:5718 TULSA
DOCUMENT NUMBER: 669989
TITLE: METHOD OF DRILLING AROUND AN EXISTING CASING PIPE TO REGENERATE AN OLD WELL
INVENTOR: HONGO, K
PATENT ASSIGNEE: HONGO CO LTD
PATENT INFO.: US 5695010 19971209
APPLN. INFO.: US 19960501
PRIORITY INFO.: JP 1995-7215468 19950802
SOURCE: US 5,695,010, C 12/9/97, F 5/1/96, PR JAPAN 8/2/95 (APPL 7-215,468) (E21B-031/16) (10 PP; 2 CLAIMS). ; Patent
LANGUAGE: English
AB A method is described for drilling the packing gravel and formation materials around an existing casing pipe in order to regenerate an old well. The method comprises the steps of (1) filling the inside of the casing pipe of the old well with water base mud, (2) connecting drill pipe, which has an inside diameter greater than the outside diameter of the existing casing pipe of the old well and is furnished with a drill bit consisting of drill cutters and nozzles at the lower extremity, to an upper water swivel, (3) setting the drill pipe in axial alignment with the existing casing pipe, (4) rotating and lowering the drill pipe while sending pressurized drilling mud through the annulus between the drill pipe and casing pipe, (5) drilling the packing gravel and formation materials encountered surrounding the casing **pipe** with the **drill** bit, (**6**) moving the cuttings up to the surface

entrained in the drilling mud, (7) separating the cuttings from the drilling mud in a mud pit, and then (8) circulating the pressurized drilling mud in the annulus between the pipes for recirculation.

L9 ANSWER 7 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 94:4357 TULSA
DOCUMENT NUMBER: 568235
TITLE: SLIM HOLE MWD (MEASUREMENT-WHILE-DRILLING) TOOL ACCURATELY MEASURES DOWNHOLE ANNULAR PRESSURE
AUTHOR: BURBAN, B; DELAHAYE, T
CORPORATE SOURCE: GEOSERVICES SA
SOURCE: OIL GAS J V 92, NO 7, PP 56-58,60-62, 2/14/94 (ISSN 00301388; 8 REFS). ; Journal
LANGUAGE: English
AB Measurement-while-drilling of down-hole pressure accurately determines annular pressure losses from circulation and drill string rotation and helps monitor swab and surge pressures during tripping. In early 1993, 2 slim-hole wells (3.4- and 3-in. diameter) were drilled with continuous real- time electromagnetic wave transmission of down-hole temperature and annular pressure. The data were obtained during all stages of the drilling operation and proved useful for operations personnel. The use of real-time measurements demonstrated the characteristic hydraulic effects of pressure surges induced by drill string rotation in the small slim-hole annulus under field conditions. The interest in this information is not restricted to the slim- hole geometry (2-5/8-in. drill pipe in a 3-in. hole). Monitoring or estimating down-hole pressure is a key element for drilling operations. Except in special cases, no real-time measurements of down-hole annular pressure during drilling and tripping have been used on an operational basis. The hydraulic effects are significant in conventional-geometry wells (3-1/2-in. **drill pipe** in a **6**- in. hole).

L9 ANSWER 8 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 93:7743 TULSA
DOCUMENT NUMBER: 548156
TITLE: DRILLING EXTENDED REACH/HIGH-ANGLE WELLS THROUGH OVERPRESSURED SHALE FORMATION IN THE CENTRAL GRABEN BASIN, ARBROATH FIELD, BLOCK 22/17, U.K. NORTH SEA
AUTHOR: GUILD, G J; CARTER, J A; JEFFREY, J T
CORPORATE SOURCE: AMOCO (UK) EXPLORATION CO; AMOCO PRODUCTION CO
SOURCE: SPE/IADC DRILLING CONF (AMSTERDAM, NETH, 2/23-25/93) PROC PP 679-688, 1993 (SPE/IADC-25749; 4 REFS). ; Conference; Conference Article
LANGUAGE: English
AB Mechanical well-bore shale stability and hole cleaning problems are associated with drilling extended reach/high angle wells through overpressured shale within the Arbroath field. Several case histories are discussed along with recommendations for drilling extended reach/high angle wells through overpressured shale. The initial attempt by Amoco UK to drill a 15,000-ft departure, extended reach well through the overpressured shale found within Block 22/17 was suspended due to improper mud weight, inadequate hole cleaning and poor bottom-hole assembly (BHA) response. The resolution of these problems over the course of 4 high angle wells involved (1) determining mud weight using rock mechanics, (2) evaluating hole conditions using a well site torque and drag program, (3) a back reaming program to clean the well bore, (4) using a variable gage stabilizer to improve steerable and packed hole BHA performance, (5) drilling 16 in. instead of a 17.5 in. intermediate hole, (6) using

6-5/8-in. **drill pipe** to improve hydraulics and hole cleaning, (7) a stuck pipe prevention class for rig crews, and (8) installing a technically advanced mud logging unit.

L9 ANSWER 9 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 93:1925 TULSA
DOCUMENT NUMBER: 542338
TITLE: WELL CONTROL CHALLENGES IN HIGHLY DEVIATED/HORIZONTAL WELLS
AUTHOR: HALAND, O A
CORPORATE SOURCE: NORWEGIAN STATE OIL CO
SOURCE: 2ND ANNU IADC EUROPE WELL CONTR CONF (STAVANGER, NORWAY, 6/11-13/91) PROC PAP NO 19, 1991 (7 PP). ; Conference; Conference Article
LANGUAGE: English
AB Extended reach drilling (ERD) has been among the most extreme achievements in the Statfjord field, including well C-10, with measured depth 6,200 m and horizontal displacement of 5,003 m and well C-3, with a measured depth of 7,250 m and horizontal displacement of 6,086 m from the Statfjord C platform, with 80(deg) sail angle. Before well C-3 was drilled, the Varco top drive was upgraded to TDS-4, the fingerboard was changed out to accommodate 3,500 m of **6**- 5/8-in. **drill pipe** and 4,000 m of 5.5-in. and/or 5-in. drill pipe to be able to drill with a tapered drill string, reduce pressure losses, and increase flow rates. The introduction of **6**-5/8-in. **drill pipe** made it necessary to upgrade the 2-stack BOP systems. Boosters were installed on both stacks, and shear tests were performed to acceptance test both systems.

L9 ANSWER 10 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 91:4583 TULSA
DOCUMENT NUMBER: 498982
TITLE: CORROSION FATIGUE FAILURE OF DRILL PIPE AND ITS PREVENTION
AUTHOR: LI, P; SONG, Z
SOURCE: OIL DRILLING PROD TECHNOL V 12, NO 2, PP 39-48,102-103, 4/20/90 (ISSN 10007393; 6 REFS; IN CHINESE). ; Journal
LANGUAGE: Chinese
AB The drill pipe is under the severe service condition of enduring tension, compression, bending, and vibration loads as well as the rotating eccentric load and additional dynamic load in the course of tripping. In accordance with an analysis of tubular goods, the failure of drill pipe caused by corrosion fatigue is ca 79.**6**% of total **drill pipe** failure. Such failure is the result of the combined effect of corrosive medium (drilling mud and formation) and the bending variable stress. Based on the failure analysis, the process of corrosion fatigue failure of drill pipe is divided into the creation of corrosive pits, growth of cracks, crack development, mud penetration, breakdown, and other stages. In general, the corrosion fatigue life of a component under cyclic load in the corrosive medium is equal to the development period of corrosive pitting, and this is the reason for short service life of drill pipe in which corrosive pitting occurred before the drill pipe is put into operation. Measures to prevent drill pipe corrosion fatigue are proposed.

L9 ANSWER 11 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 86:8233 TULSA
DOCUMENT NUMBER: 401727
TITLE: METHOD OF PREVENTING DRILL STRING OVERFLOW
INVENTOR: FAULKNER, B V

d ibib abs 1-7

L5 ANSWER 1 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 2000:4022 TULSA
DOCUMENT NUMBER: 720626
TITLE: NEW **DRILL PIPE** SIZE IMPROVES ERD (EXTENDED REACH DRILLING) AND DEEPWATER DRILLING
AUTHOR: JELLISON, M J; PAYNE, M
CORPORATE SOURCE: GRANT PRIDECO; ARCO TECHNOL & OPER SERV
SOURCE: WORLD OIL V 221, NO 1, PP 113-114,116,118,120, JAN 2000 (ISSN 00438790; COLOR; 2 REFS). ; Journal
LANGUAGE: English
AB A new product, 5-**7**/8-in. eXtreme Reach (XR) **drill pipe**, represents enabling technology for ERD, deep-water and other deep well applications. The hydraulic performance of the drill string can be a significant limitation in these applications, resulting in poor hole cleaning, slower penetration rates, diminished control over well trajectory and **drill pipe** sticking. The 5-**7** /8-in. XR provides a significant improvement in hydraulic efficiency compared to 5.5-in. **drill pipe** and does not suffer from the disadvantages associated with use of **6**-5/8-in. **drill pipe**. Realizing the full potential of 5-**7** /8 in. required development of a high-performance tool joint connection. The eXtreme Torque (XT) connection design, optimized for 5-**7** /8-in. **drill pipe**, provides exceptional torsional strength combined with a streamline configuration. The XT57 tool joint OD of **7** in. permits fishing of the connection with an overshot inside 9-5/8-in. casing or 8.5-in. openhole sections. This article discusses the engineering philosophy behind 5-**7**/8-in. XR **drill pipe**, and design challenges associated with development of the product, and it reviews features and capabilities of the new connection. An upcoming project that will use 5-**7**/8 in. is also discussed. The project, operated by ARCO China Inc. in the South China Sea, is scheduled to begin in early 2000.

L5 ANSWER 2 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 1999:4717 TULSA
DOCUMENT NUMBER: 693918
TITLE: **DRILLPIPE** AND DRILL-COLLAR JOINTS FOR EXPLORATORY ORE DRILLING (JOINT DE TRAIN DE TIGES ET DE TUBAGE POUR FORAGES D'EXPLORATION DE MINERAIS)
INVENTOR: DRENTH, C L
PATENT ASSIGNEE: BOART LONGYEAR INT HOLDING
PATENT INFO.: FR 2757563 19980626
APPLN. INFO.: FR 19971224
PRIORITY INFO.: US 1996-772860 19961224
SOURCE: FR 2,757,563, C 6/26/98, F 12/24/97, PR US 12/24/96 (APPL 772,860) (E21B-017/02) BULL OFFIC PROPRIETE IND (FR) NO 26,
P 123, 6/26/98 (ISSN 07507650; IN FRENCH; ABSTRACT ONLY) (AO). ; Patent
LANGUAGE: French
AB A drill string tool joint is described that relates to a joint comprising male (pin) and female (box) parts, each having a first section with a shoulder, a second section with a shoulder, and a tapered thread having a

root, a crest, a pressure surface and a clearance surface. Each shoulder is inclined from 5(deg) to 10(deg) with respect to the perpendicular to the central axis, the roots of the threads have a constant width, the roots have a constant depth, each of the roots and crests have a tapered (truncated-cone) surface inclined ca 0.75(deg) to 1.**6**(deg) with respect to the central axis, and the negative flank angles are **7** .5(deg) to 15(deg) with respect to a perpendicular to the central axis. This tool joint has application in **drill pipe** and **drill** collars. (Original not available from T.U.)

L5 ANSWER 3 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 1998:5718 TULSA
DOCUMENT NUMBER: 669989
TITLE: METHOD OF DRILLING AROUND AN EXISTING CASING PIPE TO REGENERATE AN OLD WELL
INVENTOR: HONGO, K
PATENT ASSIGNEE: HONGO CO LTD
PATENT INFO.: US 5695010 19971209
APPLN. INFO.: US 19960501
PRIORITY INFO.: JP 1995-7215468 19950802
SOURCE: US 5,695,010, C 12/9/97, F 5/1/96, PR JAPAN 8/2/95 (APPL 7-215,468) (E21B-031/16) (10 PP; 2 CLAIMS). ; Patent
LANGUAGE: English

AB A method is described for drilling the packing gravel and formation materials around an existing casing pipe in order to regenerate an old well. The method comprises the steps of (1) filling the inside of the casing pipe of the old well with water base mud, (2) connecting **drill pipe**, which has an inside diameter greater than the outside diameter of the existing casing pipe of the old well and is furnished with a drill bit consisting of drill cutters and nozzles at the lower extremity, to an upper water swivel, (3) setting the **drill pipe** in axial alignment with the existing casing pipe, (4) rotating and lowering the **drill pipe** while sending pressurized drilling mud through the annulus between the **drill pipe** and casing pipe, (5) drilling the packing gravel and formation materials encountered surrounding the casing **pipe** with the **drill** bit, (**6**) moving the cuttings up to the surface entrained in the drilling mud, (**7**) separating the cuttings from the drilling mud in a mud pit, and then (8) circulating the pressurized drilling mud in the annulus between the pipes for recirculation.

L5 ANSWER 4 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 94:22561 TULSA
DOCUMENT NUMBER: 586439
TITLE: AN AGENT FOR PROTECTION AND LUBRICATION OF PIPE CONNECTIONS, PARTICULARLY PIPE THREAD SECTIONS, AND TUBING ON WHICH SUCH AN AGENT IS APPLIED
INVENTOR: VIK, T K
PATENT INFO.: WO 936197 19930401
APPLN. INFO.: WO 19920909
PRIORITY INFO.: NO 1991-913627 19910913
SOURCE: WORLD 93/6,197, P 4/1/93, F 9/9/92, PR NORW 9/13/91 (APPL 913,627) (C10M-125/10) PCT GAZ V 1993, NO 9, P 4086, 4/1/93
(ISSN 02507757; ABSTRACT ONLY) (AO). ; Patent
LANGUAGE: English

AB An agent is provided for protection and lubrication of pipe connections, particularly pipe thread sections on tubing for use in oil and gas wells. This agent comprises a mixture of (1) a grease based component and (2) a solid component free of heavy metal, comprising a material in powder form containing titanium oxide (TiO2-containing material) having a hardness in the range of from **6** to **7** mohs. (Original patent not available from T.U.)

L5 ANSWER 5 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 91:8577 TULSA
DOCUMENT NUMBER: 502976
TITLE: TIGHTNESS OF THREADED JOINTS OF OIL FIELD PIPES UNDER CONDITIONS OF HYDROGEN SULFIDE CORROSION AND FLUCTUATIONS OF INTERNAL PRESSURE
AUTHOR: KHASAEV, R M; GASANOV, R YU; KHANABADLY, E M
SOURCE: IZV VYSSH UCHEB ZAVEDENII, NEFT GAZ NO 3, PP 24-29, MARCH 1990 (ISSN 04450108; 4 REFS; IN RUSSIAN). ; Journal
LANGUAGE: Russian
AB The main cause of disturbance of the tightness of threaded **joints** of **pipes** is the formation of radial gaps during internal pressure fluctuations. Corrosive hydrogen sulfide gas, penetrating into the radial gaps of the threaded joints, promotes corrosion of the joint paste and elements of the joints. On the basis of the results of experimental investigations, the following recommendations and requirements are given: (1) the materials of threaded joints and lubricant pastes should be suitable for working under conditions of hydrogen sulfide corrosion; (2) the compositions of the pastes should contain components providing neutralization of hydrogen sulfide and preventing hydrogen sulfide corrosion and expansion of the volume of the paste for filling the radial gaps formed as a result of internal pressure fluctuation; (3) the paste compositions should be resistant to temperature fluctuations; (4) the life of the components of the paste should be sufficiently long; (5) the pastes should not lose their properties under conditions of negative ambient temperatures; (**6**) the components of the pastes should not be toxic; and (**7**) the design of the threaded joints should allow the joint paste to expand. A paste is recommended containing a hydrogen sulfide neutralizer (MnO2), an expanding component (Al2O3), and an aqueous solution of caustic.

L5 ANSWER 6 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 70:4709 TULSA
DOCUMENT NUMBER: 126876
TITLE: A CURRENT REVIEW OF PROJECT MOHOLE
SOURCE: PB-175,376, 166 PP, 1966.
LANGUAGE: English
AB This current review of the Mohole Project is by Brown & Root, Inc., Staff.
The Mohole Project has been defined as a long-range research effort directed toward the study of the earth as a planet rather than a system of oceans, continents, and other earth features. The most difficult task involved in this effort will be the drilling and sampling of all the unknown layers of the earth's crust and the underlying mantle. The project status is discussed under the following subtitles: (1) confidence level of accomplishment; (2) scientific need for the Mohole Project; (3) a comparison with sedimentary drilling programs; and (4) economic, military and scientific benefits. The status of the Mohole Project system's development is set out under the following subtitles: (1) geological and geophysical; (2) oceanographic and meterological; (3) re-entry system; (4) drilling platform dynamic instrumentation; (5) borehole measurement system; (**6**) coring instrumentation; (**7**) scientific operational equipment; (8) permanent bottom-hole monitor; (9) operational laboratory equipment; (10) hoisting equipment; (11) down-hole drilling tools; (12) pipe handling system; (13) drilling fluid and content; (14) riser system; (15) rotating drilling system; (16) **drill**

pipe and tool **joints**; (16) **drill pipe**
and tool **joints**; (17) drilling equipment accessories; and (18)
platform design. equipment accessories; and (18) platform design.

L5 ANSWER 7 OF 7 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 70:3564 TULSA
DOCUMENT NUMBER: 125731
TITLE: DRILLING SECTION, PROJECT MOHOLE PROGRESS REPORT, DECEMBER 15, 1964
SOURCE: PB-175,211, 40 PP, 1964.
LANGUAGE: English
AB In this scientific and technical progress report for th period ending 12/15/64, specifications and/or descriptions are presented on the following systems: (1) hoisting system (drawworks); (2) rotating system (swivel); (3) **drill pipe** (steel **pipe** and
tool **joint** specifications, titanium **drill pipe**
and connectors); (4) riser system (riser casing stress analysis, static analysis, dynamic analysis); (5) riser support system (passive buoys, inflatable variable displacement buoys); (**6**) downhole drills (retractable diamond core bit and barrels, sidewall coring tool test); and
(**7**) equipment evaluation test well, Uvalde County, Texas.

Karen Lehman EIC 3600

PATENT INFO.: US 4577702 19860325
APPLN. INFO.: US 1985-717497 19850328
SOURCE: US 4,577,702, C 3/25/86, F 3/28/85 (APPL 717,497) (FAULKNER
OIL FIELD SER INC) (12 CLAIMS, 6 PP). ; Patent
LANGUAGE: English
AB A method is described for preventing drilling fluid overflow during the drilling of a well when the drill string suspended within the well bore is raised and drill pipe sections are removed thereform, such as when it is necessary to replace the drill bit. In accordance with the method, a tool joint is connected in the drill string near the bottom end. At least one shear plug sealingly is attached to the tool joint. When the plug is sheared, a drilling fluid flow passageway is opened from the interior to the exterior of the tool joint. The shear plug in the tool joint is sheared whereby drilling fluid contained in the drill string is drained therethrough when the drill string is raised, followed by the raising of the drill string and the removal of **drill pipe** sections. (12 claims, **6** pp)

L9 ANSWER 12 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 84:156 TULSA
DOCUMENT NUMBER: 350887
TITLE: PIPE WIPING METHOD AND APPARATUS
INVENTOR: BENTLEY, N P
PATENT INFO.: US 4399869 19830823
APPLN. INFO.: US 1982-437119 19821027
SOURCE: US 4,399,869, C 8/23/83, F 10/27/82 (APPL 437,119) (CHARLIES RENTAL) (6 CLAIMS). ; Patent
LANGUAGE: English
AB Methods and apparatus are described for wiping drilling mud and other substances from the outside surfaces of drill pipe as the drill pipe is removed from a well bore. The apparatus is comprised of a housing adapted to be attached over a well bore and positioned whereby the drill pipe passes through the housing. An inflatable pipe wiping member formed of resilient material has a central passage for providing wiping contact with the outside surfaces of the drill pipe attached within and to the housing.
Means are provided for selectively flowing a gas under pressure into or out of the pipe wiping member whereby the member can be selectively expanded or contracted to increase or decrease the force of wiping contact with the **drill pipe**. (**6** claims)

L9 ANSWER 13 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 82:13475 TULSA
DOCUMENT NUMBER: 323463
TITLE: DRILLING MACHINE OPERATES WITH SMALLER CREWS
SOURCE: WELL SERV V 22, NO 3, PP 96, 98, MAY-JUNE 1982 (ISSN 00432393). ; Journal
LANGUAGE: English
AB Walker-Neer Apache drilling machines can drill a medium-depth well in 20% less time and for 20% less cost. A significant factor in saving time and money is that the primary Apache drilling package can move in 3 loads. For short moves, rig-down to spud-in time is usually substantially less than 4 hr. The Apache 250H-40 is rated to drill to 7,000 ft with 4.5 in., 16. **6** lb/ft **drill pipe**. All operations can be controlled either from the deck of its substructure or from a fully enclosed air- conditioned dog house that can be located up to 30 ft away from the drill string. No crew member need be near the machine for it to perform routine drilling, casing or tripping operations.

L9 ANSWER 14 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:13340 TULSA
DOCUMENT NUMBER: 302112
TITLE: WELL DRILL PIPE SUPPORT
INVENTOR: FRIESEN, W
PATENT INFO.: CA 1087602 19801014
APPLN. INFO.: CA 1978-301695 19780421
SOURCE: CAN 1,087,602, C 10/14/80, F 4/21/78 (APPL 301,695). ; Patent
LANGUAGE: English
AB Vise supports particularly adapted for use with well drill strings are described. They are designed primarily for relatively small diameter well drilling, nevertheless they can be adapted readily for larger diameters if necessary or desirable. A vise clamp is provided which is easily securable over the top of the casing and which can be swung out of the way when drilling is taking place. It also can be moved into position when it is desired to support the drill string for removal of or attachment of additional **drill pipe** lengths. (**6** claims)

L9 ANSWER 15 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 80:14658 TULSA
DOCUMENT NUMBER: 286182
TITLE: FLOW OF MUD DURING DRILLING OPERATIONS
AUTHOR: RANDALL, B V; ANDERSON, D B
SOURCE: 55TH ANNU SPE OF AIME FALL TECH CONF (DALLAS, 9/21-24/80) PREPRINT NO SPE-9444, 9 PP, 1980.
LANGUAGE: English
AB Since optimum hydraulics theories dictate that hydraulic horsepower, impact, or impact force must be maximized, the decision was made to determine these pressure losses by actual tests. A total of 119 water-based drilling fluids were pumped through capillary tubes up to 2 in. in diam and through **6** standard sizes of **drill pipe** tool joint combinations. Drilling fluids were flowed through jet bit nozzles and were flowed up 2 annulus size combinations, as well as an annulus with hole enlargements. The annular tests included cuttings which aided in determining flow patterns. The work includes development of friction factors and empirical corrections for current theories to more reasonably model flow of highly non-Newtonian fluids. Procedures and equations are offered which help estimate pressure losses in a drilling operation, even with very limited fluid property information typical of the industry.

L9 ANSWER 16 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 79:1741 TULSA
DOCUMENT NUMBER: 259429
TITLE: SUPPORT DEVICE FOR PIPE DRILLER
INVENTOR: WALKER, R J
PATENT INFO.: US 4105358 19780808
APPLN. INFO.: US 1976-726816 19760927
SOURCE: U S 4,105,358, C 8/8/78, F 9/27/76 (APPL 726,816). ; Patent
LANGUAGE: English
AB A clamp for a pipe-tapping device is described which is clampable to a pipe over only a lower portion, thereby eliminating excavating under the pipe while affording a secure attachment. A support means for the tapping unit has arm members that extend in opposing directions from the support and are pivotally attached to it. Screw-type means are associated with the arm members at one end to move the opposing ends toward and away from the

pipe surface and engage the pipe along a number of contact points above the bottom portion of the pipe. Two pairs of opposing arm members are employed and are engaged by a turnbuckle linkage to move them in opposing directions. The pipe-engaging portions of the arms are concave and terminate in engagement above the lowermost surface of the pipe. The support also has concave contacting portions to partially surround the uppermost portions of the pipe and clamping means to engage the **pipe drill**. (**6** claims)

L9 ANSWER 17 OF 17 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 78:1370 TULSA
DOCUMENT NUMBER: 244302
TITLE: FUNDAMENTALS OF PRESSURE CONTROL. PT. 3. CONTROL METHODS
AUTHOR: KENDALL, H A
SOURCE: PETROL ENG V 49, NO 13, PP 53, 56, 58, 62, DEC 1977.
LANGUAGE: English

AB Study of basic fundamentals allows both simple and more complex well-control problems to be solved. Keeping the U-tube in mind, and studyinig the annulus, drill pipe, and bottom-hole pressures (BHP), all methods merge into one--keep the bottom-hole pressure constant at the bottom-hole static pressure, or shut-in pressure, plus a small pressure increase. If this is done, then for all practical purposes what happens in one side of the U-tube will have no effect on the other, and each side can be studied separately. The sequence of events described for the driller's method are (1) shut in well; (2) bring pump to speed; (3) bring gas to surface; (4) gas out; (5) start heavy (kill) mud in **drill pipe**; (**6**) heavy mud reaches the bit; and (7) heavy mud is returned to the surface. At this point, the well should be dead. Static drill-pipe pressure will be considered first in relation to BHP. All other pressures will be disregarded. Static drill-pipe pressure is the pressure required at the top of the drill pipe at any time of the kill procedure to balance BHP if circulation is stopped and the well shut in.

d ibib abs 1-2

L12 ANSWER 1 OF 2 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 86:8884 TULSA
DOCUMENT NUMBER: 402378
TITLE: AUTOMATIC DRILL PIPE INSIDE WIPER
INVENTOR: RADFORD, S R; HYLAND, C R
PATENT INFO.: US 4580635 19860408
APPLN. INFO.: US 1983-544265 19831021
SOURCE: US 4,580,635, C 4/8/86, F 10/21/83 (APPL 544,265) (NORTON CHRISTENSEN INC) (10 CLAIMS, 7 PP). ; Patent
LANGUAGE: English
AB A direct acting slug and wipe tool for use in drill pipe in drilling operations effects a cleaning operation by placing a rib inflated bladder in contact with the inside surface of a drill pipe in connection with a free floating pneumatic chamber. The inflatable bladder is toroidal and circumferentially disposed about and communicates with a sealed and closed chamber filled with a fixed amount or mass of gas. Weights may be added to the wiper in order to fix its equilibrium floating position. The wiper with the inflatable bladder is able to wipe the interior of the drill pipe even through those portions having a reduced inner diameter, such as at the drill **pipe joints**. (10 claims, **7** pp)

L12 ANSWER 2 OF 2 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 74:4064 TULSA
DOCUMENT NUMBER: 187334
TITLE: METHOD OF TREATING TUBULAR GOODS WHILE SIMULTANEOUSLY TESTING THE INTERIOR THEREOF
INVENTOR: IGLEHART, J H; IGLEHART, H H
PATENT INFO.: US 3787226 19740122
APPLN. INFO.: US
SOURCE: U S 3,787,226, C 1/22/74, F 11/23/71; SPINNING PIPE SERVICE INC. ; Patent
LANGUAGE: English
AB A method of treating tubular goods with an inhibitor consists of forcing the inhibitor into intimate contact with the surface area of the metal goods to be treated by utilizing high pressure techniques. The inhibitor is forced into the multitude of cracks and minute voids located in the irregular surface of the metal, so that after the pressure is removed and the inhibitor drained from the surface, a coating of the inhibitor is left within the outer boundary of the metallic surface, thereby forming a protective film on the surface of the metal. Advantage is taken of this expedient to provide a method of simultaneously treating pipe surfaces with an inhibiting agent, while at the same time the **pipe joints** are hydrostatically tested. (**7** claims)

L5 ANSWER 16 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 95:18400 TULSA
DOCUMENT NUMBER: 606308
TITLE: DOUBLE SHOULDER TOOL **JOINT** FOR SLIM HOLE
AUTHOR: WEICH, S; KIRKPATRICK, R; SMITH, J
CORPORATE SOURCE: SHELL CANADA LTD; ENTERRA CANADA LTD; GRANT TFW
SOURCE: CADE/CAODC SPRING DRILLING CONF (CALGARY, CAN, 4/19-21/95) PROC PAP NO 95-904, 1995 (11 PP). ; Conference; Conference Article
LANGUAGE: English
AB The Grant TFW's 79.38-mm (3-1/8 in.) x 50.17-mm (1.975 in.), 2-3/8 HTSLH90
connection is a double shoulder tool **joint** with much greater torsional strength than the same size conventional API **joints**. The double shoulder design provides the needed torsional strength for slim
hole applications and it gives the connector a measure of wear allowance not possible on API connections. This paper describes the analysis, design, and testing of the tool **joint** and discusses applications of **drill pipe** produced with the connection. **Drill pipe** with the **joint** has been used in applications where (1) API or PAC tool **joints** are not strong enough; (2) small **ODs** and large **IDs** are needed for hydraulics and fishability; and (3) wear of conventional tool **joints** causes premature downgrading to Class II.

L5 ANSWER 17 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 95:12950 TULSA
DOCUMENT NUMBER: 600858
TITLE: DRILLING RIG KELLY SPINNER
INVENTOR: STOGNER, H
PATENT INFO.: US 5396952 19950314
APPLN. INFO.: US 1993-139415 19931020
SOURCE: US 5,396,952, C 3/14/95, F 10/20/93 (APPL 139,415) (E21B-003/00) (6 PP; 12 CLAIMS). ; Patent
LANGUAGE: English
AB A kelly spinner ring gear can be attached to the stem of an oil derrick swivel by compression of an adjustable sleeve. In such a manner, axial play in the ring gear can be minimized. A kelly spinner is provided for making up and breaking out a **joint** of **drill pipe** in an oil well drilling operation. The spinner comprises a cylindrical housing having a central opening. An adjustable sleeve concentric with the central opening is provided for receiving a stem of a derrick swivel. The sleeve has an **outer diameter** surface and includes axial stop pins affixed thereto. A clamp made up of a
hub member and an associated flange member is provided for locking the sleeve to the swivel stem. The clamp is disposed adjacent the sleeve pins and **outer diameter** surface, forming a radial slot therebetween. A cylindrical locking ring assembly is disposed in the radial slot. The locking ring assembly includes dual axially split members
having complementary angled axial surfaces. A ring gear is fixedly attached to the clamp. A motor mounted in the housing is in rotational engagement with the ring gear.

L5 ANSWER 18 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 94:16878 TULSA
DOCUMENT NUMBER: 580756
TITLE: DRILL STRING CUTTER WITH PREVENTED FALL OUT FROM CUT-OUT PIPE - HAS OVERSHOT MOUNTED ON BEARINGS AND CUTTINGS TRAP, FITTED BETWEEN CUTTERS ON CENTRALISER
PATENT ASSIGNEE: KOLA EXTRA DEEP DRILL GEO
PATENT INFO.: RU 2001241 19931015

APPLN. INFO.: RU 1991-4901973 19910111
SOURCE: RU 2,001,241-C1, P 10/15/93, F 1/11/91 (APPL 4,901,973) (E21B-029/00) SOVIET PAT ABSTR NO 9407, P 4-H, 4/6/94 (IN RUSSIAN; ABSTRACT ONLY) (AO). ; Patent
LANGUAGE: Russian

AB Pipe cutter has two cylindrical casings connected to a hollow cylinder with cutters mounted on pins. Annular milling cutter is fitted on bottom end of the casing (2). An overshot is fitted in the casing on bearings also regulating ring and spring-loaded sleeve interacting with the cutters. Well cuttings trap is in the casing between the cutters and a centraliser. Cutter is preferably lowered on the **drill pipe** in the hole till the overshot is below the tool **joint** , above which the **drill pipe** is to be cut. Cutter is pulled up, the overshot on reaching the tool **joint** compresses the spring which pushes the sleeve down and the cutters are put in working position. During cutting of the pipe the overshot is stationary. Fall out of cutting from the cut out pipe is prevented by the trap, which is located below the cutters and consists of spring steel bands. These deform allowing the cut pipe to pass through, and then return into the initial position and cover **inner diameter** of the cutter.
ADVANTAGE - Reliable when cutting **drill pipe** containing well cuttings, fall out of which is prevented from cut out pipe. (c1994 Derwent Publications Ltd.) (Original patent not available from T.U.)

L5 ANSWER 19 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 94:13547 TULSA
DOCUMENT NUMBER: 577425
TITLE: DRILL STRING INSEPARABLE PROTECTOR - COMPRISING RIBBED SLEEVE WITH SLOTS HAVING TRAPEZOIDAL VERTICAL SECTIONS WITH LARGE BASES FACING SLEEVE AXIS
PATENT ASSIGNEE: UFA PETROLEUM INST; AZERB AZIZBEKOV PETROCHEM
PATENT INFO.: SU 1779739 19921207
APPLN. INFO.: SU 1989-4725599 19890731
SOURCE: USSR 1,779,739-A1, P 12/7/92, F 7/31/89 (APPL 4,725,599) (E21B-017/10) SOVIET PAT ABSTR NO 9351, PP 4-H - 5-H, 2/16/94 (IN RUSSIAN; ABSTRACT ONLY) (AO). ; Patent
LANGUAGE: Russian

AB The protector comprises an elastic ring with outer reinforcing prestressed elastic ribbed sleeve with slots. The sleeve's slots in vertical plane have form of trapezes with larger bases facing its central axis. Slots of the ribs have form of trapezes with smaller bases facing the axis. The protector is put in prestressed condition on the sub connecting the kelly to **drill pipe** and on each **drill pipe** . ADVANTAGE - Increases service life of kelly, **drill** and casing **pipes** and is reliable in service. The protector shields the drilling string from impacts and dynamic loads during the string retrieving and lengthening operations. End sections of the protector resist the loads particularly well as the ribs have slots. Dynamic loads deform the elastic ring which increases meshing of the protector's **outer diameter**. This enhances dampening of vibrations and improves centering of the drill string. (c1994 Derwent Publications Ltd.) (Original patent not available from T.U.)

L5 ANSWER 20 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 94:1994 TULSA
DOCUMENT NUMBER: 565872
TITLE: HEAVY WALL **DRILL PIPE** AND METHOD OF MANUFACTURE OF HEAVY WALL **DRILL PIPE**
INVENTOR: DECELL, A L; PERKIN, G S; PATARINI, P

PATENT ASSIGNEE: TRIUMPH LOR INC
PATENT INFO.: CA 1317930 19930518
APPLN. INFO.: CA 1987-533331 19870330
SOURCE: CAN 1,317,930, C 5/18/93, F 3/30/87 (APPL 533,331) (E21B-017/00) (22 PP; 15 CLAIMS). ; Patent
LANGUAGE: English
AB The method of manufacture of an integrally forged **drill pipe** includes the steps of placing a substantially cylindrical ingot in a multi-hammer forging press and manipulating the ingot through the press to form a substantially elongated fully forged **drill pipe** bar having an outside surface formed of an indeterminate number of indentations caused by the impact of the forging hammers thereon. The **drill pipe** bar comprises a central body section having upper and lower generally cylindrical body sections and a centrally located protector section of larger diameter and upper and lower end connector sections of larger diameter. The **drill pipe** bar is then straightened such that the longitudinal axis of the bar is a substantially straight line. The upper and lower end connectors of the **drill pipe** bar are then machined to form substantially cylindrical outside surfaces of the same **outer diameter** at each end of the bar. The central protector is then machined to form a generally cylindrical outside surface thereon. A bore is then machined through the bar and an interiorly threaded end portion is machined in the upper end connector and an exteriorly threaded end portion is machined on the lower end connector.

L5 ANSWER 21 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 93:18782 TULSA
DOCUMENT NUMBER: 559195
TITLE: DRILL SECTION OF A DRILLING TOOL
INVENTOR: COLLINSWORTH, S M
PATENT INFO.: US 5222565 19930629
APPLN. INFO.: US 1992-869231 19920414
SOURCE: US 5,222,565, C 6/29/93, F 4/14/92 (APPL 869,231) (E21B-017/02) (12 PP; 19 CLAIMS). ; Patent
LANGUAGE: English
AB A drill section includes a hollow tube having a reduced portion of a tool **joint** box disposed in each end. Each box is welded to the hollow tube by a circumferential weld extending around an angled portion connecting the reduced portion of the box to a portion of the box having the same **outer diameter** as the hollow tube. There preferably is welding of the reduced portion of the box to the hollow tube through 3 equally angularly spaced slots at each of the hollow tube. A break out ring is disposed on a threaded pin of a tool **joint** between the box, which has a threaded recess extending inward from its end to receive the threaded tool **joint** pin to attach the tool **joint** to the box and an annular surface of the tool **joint** . A protective sleeve on the box has an annular end surface at the same angle to its longitudinal axis as an annular end surface of a collar, which is welded to the box, and is held thereagainst by the tool **joint** attached to the box.

L5 ANSWER 22 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 93:6211 TULSA
DOCUMENT NUMBER: 546624
TITLE: FATIGUE TESTING OF **DRILLPIPE**
AUTHOR: GRONDIN, G Y; KULAK, G L
CORPORATE SOURCE: BUCKLAND & TAYLOR LTD; ALBERTA UNIV
SOURCE: SPE UNSOLICITED PAP NO SPE-24224 (DEC 1992) (23 PP; 21

REFS).
LANGUAGE: English
AB An experimental investigation of the fatigue strength of Grade E 4.5-in. **OD** 16.6 lb/ft (114 mm **OD**, 24.7 kg/m), **drill pipe** was conducted. A test set up was devised to test **drill pipe** in rotating bending, under an axial preload, and with or without corrosion present. The test program included 29 tests in air and 27 tests in a 3.5% sodium chloride solution. The effects of stress range, mean stress, corrosion, and upset geometry were investigated. The effects of stress range and mean stress were found to be significant in both non-corrosive and corrosive environments. The effect of upset geometry was found to be minimal when an external upset was compared to an internal- external upset. Grinding marks, present on the surface of **drill pipe** as a result of inspection carried in the mill, were at the origin of ca 60% of the failed specimens.
Grinding was found to create a notch effect and induce a detrimental residual stress pattern on the surface, which has the effect of decreasing the fatigue life of **drill pipe**.

L5 ANSWER 23 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 92:11288 TULSA
DOCUMENT NUMBER: 527379
TITLE: **DRILLPIPE** FOR HORIZONTAL DRILLING
AUTHOR: SMITH, J E
CORPORATE SOURCE: GRANT TFW INC
SOURCE: SPE PERMIAN BASIN OIL & GAS RECOVERY CONF (MIDLAND, TEXAS, 3/18-20/92) PROC PP 453-462, 1992 (SPE-23990; 4 REFS). ; Conference; Conference Article
LANGUAGE: English
AB Horizontal or extended reach drilling is a rapidly emerging technology that, in some areas, can be considered the norm rather than the exception.
While most horizontal drilling is done with the same pipe that would be used in the same size vertical hole, a different pipe or tool **joint** type may improve the overall drilling performance and efficiency. **Drill pipe** selection is discussed based on the influence of (1) pipe weight on torque and drag, (2) pipe **OD** and **ID** dimensions on torsional strength, buckling capacity, fatigue resistance and hydraulic efficiency, and (3) tool **joint** dimensions on torsional strength and hydraulic efficiency.

L5 ANSWER 24 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 91:19480 TULSA
DOCUMENT NUMBER: 513879
TITLE: **DRILL PIPE** MANAGEMENT EXTENDS DRILLSTRING LIFE
AUTHOR: SHEPARD, J S
CORPORATE SOURCE: GLOBAL MARINE DRILLING CO
SOURCE: OIL GAS J V 89, NO 43, PP 46-48,50-51, 10/28/91 (ISSN 00301388). ; Journal
LANGUAGE: English
AB Better handling procedures and frequent **drill pipe** inspections prolong the life of a drill string. Crews taught to make quick visual inspections during rig moves and tripping can spot problem pipe early, thus preventing downtime or extensive repairs. Because of escalating costs of drill string repair and replacement, Global Marine Drilling Co. organized a task force in March 1989 to define problem areas and establish new handling and maintenance procedures. The task force estimated that one 20,000-ft drill string costs ca $600,000 and has a 7-yr

life span. Assuming the average rig life is 21 yr, each rig will wear out 3 strings, totaling $1.8 million. The addition of $30,000/yr for full rack inspections, repairs, and down- hole loss brings the total to approx. $2.4 million/rig over the 21 yr. The task force identified 4 basic causes of **drill pipe** failures: (1) tool **joint** and tube **OD** wear, (2) internal corrosion, (3) fatigue cracking in the slip and internal upset areas, and (4) physical damage to the tool **joint** threads and shoulders, and to the tube.

L5 ANSWER 25 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 91:13041 TULSA
DOCUMENT NUMBER: 507440
TITLE: TOOL **JOINT** AND METHOD OF HARDFACING SAME
INVENTOR: CARLIN, F J
PATENT ASSIGNEE: BAKER HUGHES INC
PATENT INFO.: CA 2023297 19910316
APPLN. INFO.: CA 19900815
PRIORITY INFO.: US 1989-408074 19890915
SOURCE: CAN 2,023,297, P 3/16/91, F 8/15/90, PR US 9/15/89 (APPL 408,074) (E21B-003/00; B23P-015/28) (18 PP; 11 CLAIMS). ; Patent
LANGUAGE: English
AB A method is provided for applying grooved bands of hard surfacing on a tool **joint** for **drill pipe**. The hard facing of the tool **joint** has tungsten carbide granules in an alloy steel matrix. The tool **joint** is rotated, and an arc between an electrode and the tool **joint** creates a weld puddle. The electrode is reciprocated parallel to the tool **joint** axis, and the granules are fed into the weld puddle, with the puddle being applied to the grooved bands around the exterior of the tool **joint** to a groove depth between 0.75 to 0.150 in. The feed of the granules into the weld puddle is discontinued, and the weld puddle is continued to be applied around the tool **joint** and in the grooved bands to provide a protruding, tungsten carbide-free hard facing surface about the **outer diameter** of the tool **joint** between 0.050 to 0.175 in. The hard facing surface is machined down to the **outer diameter** of the tool **joint**.

L5 ANSWER 26 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 91:6440 TULSA
DOCUMENT NUMBER: 500839
TITLE: DRILL STEM ARRANGEMENT AND METHOD
INVENTOR: MCNEELY, B M JR
PATENT INFO.: US 4987961 19910129
APPLN. INFO.: US 1990-461046 19900104
SOURCE: US 4,987,961, C 1/29/91, F 1/4/90 (APPL 461,046) (E21B-007/16) (12 PP; 20 CLAIMS). ; Patent
LANGUAGE: English
AB A drill stem member provides a combination of reduced weight with increased resistance to buckling under compressive loading and includes a tubular member with tool **joints** at each end for connection to form a drill stem. The tubular member includes a first portion or pipe section adjacent either of the tool **joints** and may include a second portion or pipe section adjacent the other tool **joint** which are of smaller or reduced diameter than the adjacent tool **joint**. An enlarged portion extends longitudinally of the tubular member from adjacent the first portion to adjacent the second portion where there is a second portion adjacent the other tool **joint**. If there is only one first portion adjacent one tool **joint**, the enlarged diameter extends from adjacent such first portion to the tool **joint** at the other end of the tubular member. The enlarged portion has a larger **inner** and **outer diameter** than

the adjacent first portion.

L5 ANSWER 27 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 90:10310 TULSA
DOCUMENT NUMBER: 484647
TITLE: LARGER DRILLSTRINGS COULD IMPROVE CONTRACTOR PROFITS
AUTHOR: DUDMAN, R L; DUDMAN, R A
CORPORATE SOURCE: PINTEC SERVICES INC
SOURCE: WORLD OIL V 210, NO 3, PP 83,85,87,89,91, MARCH 1990 (ISSN 00438790). ; Journal
LANGUAGE: English
AB Changes in drilling operating conditions require changes in drill string design in order to provide a longer service life and reduce excessive **outer diameter** wear and premature fatigue failure. A low stress level drill string design can minimize wear and fatigue, drill straight and trouble-free holes, and reduce operating expenses. Large diameter drill collars with balanced drill collar pin and box connections are the best basic tool for minimizing connection failures, controlling hole deviation, and providing usable weight to the bit. The pinup bottom-hole assembly consisting of drill collars, stabilizers, and reamers has overshot fishability, but sacrifices washover ability. Crossing over from the relatively short (ca 65 ft) bottom-hole assembly to drill collars with the maximum fish **outer diameter** to catch and/or washover provides a stiffer, heavier, stronger low stress level drill collar string with a significantly longer service life because of the stronger connections and additional diameter for longer wear. Rig fuel costs and pipe expense should also be reduced.

L5 ANSWER 28 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 89:18726 TULSA
DOCUMENT NUMBER: 470989
TITLE: HIGH-TEMPERATURE PERFORMANCE OF ROTARY-SHOULDERED CONNECTIONS
AUTHOR: MANEY, J J; STROZIER, C A
CORPORATE SOURCE: UNOCAL CORP; JET-LUBE INC
SOURCE: 64TH ANNU SPE TECH CONF (SAN ANTONIO, 10/8-11/89) PROC (D-
DRILLING) PP 345-356, 1989 (SPE-19554; 5 REFS). ; Conference; Conference Article
LANGUAGE: English
AB High temperature make-up and break-out tests were conducted on full size 6.25-in. (15.88 cm) **OD** x 2.75-in. (6.99 cm) **ID** NC46 rotary shouldered connections to determine changes in performance between room temperature and 500(deg)F (260(deg)C). Results of room temperature tests indicated that the move torque was essentially equal to the make-up torque and that the slopes of the torque vs. rotation curves were similar. In high temperature tests, a used tool **joint** connection was torqued to 48,200 lbf-ft without failure, while a new connection only reached a maximum torque of 25,600 lbf-ft before failure. It was found that increased thread interference from the rough surface finish typically found on the thread flanks of used connections was responsible for the change in performance. The problem of down-hole makeup was successfully overcome in the field by implementation of new break-in procedures and through use of a special high temperature thread compound.

L5 ANSWER 29 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 89:16527 TULSA
DOCUMENT NUMBER: 468790
TITLE: **DRILL PIPE** HANDLING DEVICE
INVENTOR: SCHIVLEY, G P

PATENT ASSIGNEE: INGERSOLL RAND CO
PATENT INFO.: US 4834441 19890530
APPLN. INFO.: US 1987-125252 19871125
SOURCE: US 4,834,441, C 5/30/89, F 11/25/87 (APPL 125,252) (B66C-001/66; E21B-019/06) (5 PP; 4 CLAIMS). ; Patent
LANGUAGE: English

AB A pipe elevator is described that can be used on plain end **drill pipe**. The elevator assembly has a bifurcated collar and an annular basket assembly with lifting bails attached. The collar includes 2 semiannular segments having meshing lugs and ears at each end. When meshed, bores are aligned through the lugs and ears so that hinge pins can secure the segments together. The interior diameter of each semiannular segment has substantially a concaved shape dimensioned to accept the rounded **outer diameter** of the **drill pipe**. Each collar segment also has a straight portion which mates with the flat sections of the **drill pipe** to axially fix the collar on the **drill pipe**. The basket assembly includes an annular flange member adapted to easily slide over the **drill pipe outer diameter**. The flange has an **outer diameter** dimension such that the top surface will provide a lifting surface on the bottom of the collar. Lifting bails are provided on the basket assembly so as to allow the assembly to be lifted by the drill rig hoist.

L5 ANSWER 30 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 88:17525 TULSA
DOCUMENT NUMBER: 447952
TITLE: NEW "PIN-UP" STRINGS SLASH DRILLING COSTS
AUTHOR: DUDMAN, R A
CORPORATE SOURCE: PINTEC
SOURCE: DRILLING CONTRACT V 44, NO 5, PP 41,43, AUG-SEPT 1988 (ISSN 00460702). ; Journal
LANGUAGE: English

AB The concept of the pin-up drill string design is yielding substantial savings. The concept involves the use of patented pin-up drill string components that permit using large drill collars in relatively small holes. The result is a stiffer and heavier bottom-hole assembly with a larger connection size for strength and a large size drill string for improved hydraulics. The first pin-up drill strings were run in Louisiana for a major operator whose primary concern was deviation problems. This operator has completed 5 wells, using tapered drill string designs, in the Baton Rouge, Breaux Bridge, and Crowley areas. All hole sizes drilled were either 6.5-in. **ID** or 6.75-in. **ID**. It was determined that sufficient hydraulic horsepower could be made available to the bit through a conventional 3.5-in. **drill pipe** string that tapered back to conventional 5-in. **drill pipe**. In these cases, 4-in. FH pin-up **drill pipe** was not used. In order to strengthen and stiffen the bottom- hole assembly, either 5.25-in. **OD** or 5.5-in. **OD** pin-up drill collars were used in conjunction with 4-in. FH pin-up heavy wall **drill pipe**. The 5.5-in. **OD** pin-up drill collar assemblies were 65% stronger torsionally and 85% stiffer than their conventional 4.75-in. **OD** counterparts. The chances of differentially sticking were also minimized due to the shot pin-up drill collar and pin-up Hevi-Wate combination in comparison to a long string of conventional drill collars.

L5 ANSWER 31 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 88:1063 TULSA
DOCUMENT NUMBER: 431490
TITLE: INCREASING PENETRATION RATES WITH HIGH-PRESSURE MUD

AUTHOR: MCNALLY, R
SOURCE: PETROL ENG INT V 59, NO 12, PP 46-47, DEC 1987 (ISSN 01648322). ; Journal
LANGUAGE: English
AB Utilizing high-pressure pumping technology developed for jet cutting and boring operations may improve penetration rates of conventional oil and gas drilling rigs by as much as 300%. Using a concentric drill string, the high-pressure mud stream goes through the inner string at a rate of 30 to 40 gal/min. The annulus between the inner and outer strings carries mud at conventional rates. Smaller flow rates and focusing the high-pressure mud on the bottom of the hole are what make the system work. The system also can help drillers cut straighter holes. The inside pipe, which is 2- in. **OD** with a 1-1/4-in. **ID**, is permanently installed in each **joint** of conventional 7-1/2-in. drill pipe and is made up by a stabbing mechanism while the outside pipe is spun together normally. The high-pressure system does not call for any changes in conventional rig-floor activity.

L5 ANSWER 32 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 86:14507 TULSA
DOCUMENT NUMBER: 408001
TITLE: NEW TOOL **JOINT** IMPROVES HIGH-ANGLE DRILLING
AUTHOR: SHRYNE, R; SMITH, J E
CORPORATE SOURCE: THUMS LONG BEACH CO; HUGHES TOOL CO
SOURCE: PETROL ENG INT V 58, NO 9, PP 44-46, SEPT 1986 (ISSN 01648322). ; Journal
LANGUAGE: English
AB Thums Long Beach Co. has been drilling highly deviated wells from 4 islands in Long Beach Harbor for more than 20 yr to tap the East Wilmington field reservoir lying under the harbor and the city of Long Beach, Calif. Application of a new **drill pipe** connector is improving drill string performance on 3 of the 7 rigs drilling on the islands. Approximately one-half the wells being drilled have a vertical deviation greater than 50(deg), so that the **drill pipe** is almost always run in compression, and constant rubbing of the pipe and tool **joint** on the hole wall promotes **outer diameter** wear and high drilling torques. The new **drill pipe** connector is the 5-in. HT50 HiTorque connector with Smooth-X hardfacing. These connectors' large bore diameter provides an excellent path for hydraulics and for wireline tool passage. The new connectors have an additional shoulder on the pin nose and in the box. This secondary shoulder gives the connector ca 40% more torsional capacity than a conventional tool **joint**, and inhibits down-hole makeup because of the added frictional resistance. The connectors can be welded to standard weights, grades, and upset configurations of **drill pipe**. The wear resistance of the new connectors has been demonstrated after extensive field use.

L5 ANSWER 33 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 86:10901 TULSA
DOCUMENT NUMBER: 404395
TITLE: NEW TOOLS ALLOW MEDIUM-RADIUS HORIZONTAL DRILLING
AUTHOR: DECH, J A; HEARN, D D; SCHUH, F J; LENHART, B
CORPORATE SOURCE: ARCO OIL & GAS CO; NORTON CHRISTENSEN INC
SOURCE: OIL GAS J V 84, NO 28, PP 95-99, 7/14/86 (ISSN 00301388). ;
Journal
LANGUAGE: English
AB ARCO Oil & Gas Co. has completed a project to develop new methods of drilling conventional-sized horizontal holes. A well bore of this type is

particularly well-suited for producing low-permeability, fractured reservoirs at economic rates. Special drilling tools and support equipment were developed **jointly** with several major manufacturers. Of these tools, one of the systems developed with Norton Christensen most nearly met the design goals. This system was tested in Rockwall County, Texas, where a 6-in. **OD** horizontal hole was successfully drilled in the Austin chalk formation. The build rate from vertical to horizontal was 20 /100 ft; the horizontal portion of the well bore was drilled for another 1,340 ft. This gave a total horizontal displacement of 1,630 ft. The horizontal well bore was kept within a 30-ft vertical section.

L5 ANSWER 34 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 86:8884 TULSA
DOCUMENT NUMBER: 402378
TITLE: AUTOMATIC **DRILL PIPE** INSIDE WIPER
INVENTOR: RADFORD, S R; HYLAND, C R
PATENT INFO.: US 4580635 19860408
APPLN. INFO.: US 1983-544265 19831021
SOURCE: US 4,580,635, C 4/8/86, F 10/21/83 (APPL 544,265) (NORTON CHRISTENSEN INC) (10 CLAIMS, 7 PP). ; Patent
LANGUAGE: English
AB A direct acting slug and wipe tool for use in **drill pipe** in drilling operations effects a cleaning operation by placing a rib inflated bladder in contact with the inside surface of a **drill pipe** in connection with a free floating pneumatic chamber. The inflatable bladder is toroidal and circumferentially disposed about and communicates with a sealed and closed chamber filled with a fixed amount or mass of gas. Weights may be added to the wiper in order to fix its equilibrium floating position. The wiper with the inflatable bladder is able to wipe the interior of the **drill pipe** even through those portions having a reduced **inner diameter**, such as at the **drill pipe joints**. (10 claims, 7 pp)

L5 ANSWER 35 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 86:7018 TULSA
DOCUMENT NUMBER: 400512
TITLE: DRILL STRINGS TAKE ON NEW LOOK
AUTHOR: MOORE, S D
SOURCE: PETROL ENG INT V 58, NO 4, PP 20-22, APRIL 1986 (ISSN 01648322). ; Journal
LANGUAGE: English
AB A synopsis is presented of various new technologies affecting today's drill string. Drill string hardfacing is an important consideration in drilling operations. Hardfacing can significantly prolong **drill pipe** life and thus reduce operating costs for the drilling contractor. Rubber or steel **drill pipe** protectors can be useful. **Drill pipe** protectors, placed on the **drill pipe** between tool **joints**, provide lateral support and prevent **drill pipe** wear. **Drill pipe** protectors allow greater permissible hole curvature. Greater hole curvature is achievable because **drill pipe** protectors reduce **drill pipe** wear without increasing casing wear. Also, **drill pipe** protectors allow heavier weights on bit and consequently faster drilling. Another new tool is a drill string blowout preventer, which can be run at all times as part of the drill string. The preventer will automatically close the drill string's **ID** if reverse circulation occurs due to a kick or blowout. Stabilization of the drill string is a critical design parameter for the drilling engineer. Bottom-hole assembly performance is greatly

affected by stabilizer gage, stiffness, and wall contact. Extensive work has been conducted in developing a new generation of positive displacement and turbine down-hole motors. Use of mud motors can have a dramatic effect in reducing drilling costs. (15 refs.)

L5 ANSWER 36 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 85:22029 TULSA
DOCUMENT NUMBER: 393208
TITLE: APPARATUS FOR CONNECTING A DRILLING STRING WITH A PIPE OR SIMILAR (VORRICHTUNG ZUM VERBINDEN EINES BOHRSTRANGES MIT EINEM ROHR **OD**. DGL.)
INVENTOR: TIBUSSEK, F
PATENT INFO.: DE 3439653 19850718
APPLN. INFO.: DE 1984-3439653 19841030
SOURCE: GER PS 3,439,653, C 7/18/85, F 10/30/84 (APPL 3,439,653) (WIRTH MASCH BOHR FABR GMBH); ABSTR, AUSZUEGE AUSLEGESCHR PATENTSCHR (GER) V 31, NO 29, PP 2830-2831, 7/18/85 (IN GERMAN) (ISSN 01784250) (AO). ; Patent
LANGUAGE: German
AB This hydraulic system consists of elements attached to the drilling string and connector elements attached to the pipe with which the drilling string is to be connected. Coupling is achieved by sending pressurized hydraulic fluid to the system; disconnecting is by spring force. The hydraulic system has 3 connections: one for the supply of hydraulic fluid, one for connecting with the hydraulic cylinder, and one for exhausting the pressurized hydraulic fluid. A special coupling with a 3-way valve is provided to direct the pressurized hydraulic fluid where it is needed. (Abstract only - original patent not available from T.U.)

L5 ANSWER 37 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 85:16593 TULSA
DOCUMENT NUMBER: 387772
TITLE: APPARATUS FOR INTERNALLY TESTING A PLURALITY OF INTERCONNECTED PIPE SECTIONS
INVENTOR: HAILEY, C D
PATENT INFO.: US 4519238 19850528
APPLN. INFO.: US 1983-489591 19830428
SOURCE: US 4,519,238, C 5/28/85, F 4/28/83 (APPL 489,591) (20 CLAIMS). ; Patent
LANGUAGE: English
AB An apparatus and method are described for simultaneously testing the integrity of the pipe walls and **joints** of a number of interconnected pipe sections in order to decrease the time required for pressure testing the drill string. The device includes an elongated conduit of cylindrical shape, having an **outer diameter** smaller than the **inner diameter** of the pipe sections providing a radial clearance. A number of packers are included. The packers are of appropriate size and shape so that when expanded they provide a seal against the interior of the pipe section, producing a number of annular chambers between the testing apparatus and the pipe. Alternate annular chambers are appropriately sized and spaced for testing the integrity of the pipe **joints** and pipe section walls. (20 claims)

L5 ANSWER 38 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 84:2353 TULSA
DOCUMENT NUMBER: 353084
TITLE: PIPE **JOINT**
INVENTOR: RAULINS, G M; GRIMMER, G G
PATENT INFO.: GB 2118658 A 19831102

APPLN. INFO.: GB 19830317
PRIORITY INFO.: US 1982-367952 19820413
PRIORITY INFO.: US 1983-456526 19830107
SOURCE: GR BRIT 2,118,658A, P 11/2/83, F 3/17/83, PR US 4/13/82 (APPL 367,952) AND US 1/7/83 (APPL 456,526); (OTIS ENGINEERING CORP) (21 CLAIMS). ; Patent
LANGUAGE: English

AB A pipe **joint** is described in which a metal-to-metal seal is provided on the exterior of the pipe. A torque shoulder provides a further metal-to-metal seal, and another seal is provided by a resilient ring located in the box at the last thread. The box is protected against ballooning by proportioning the thickness of the box. The wall thickness of the box at the point of maximum diameter of the engaged and sealing surfaces relative to the **outer diameter** of the coupling is approx. equal to or greater than the ratio of the full wall thickness of the pipe relative to the **outer diameter** of the pipe so that the box will be as resistant to ballooning under internal pressure as will the pipe. This will prevent ballooning of the coupling and the possible resultant disengagement of the threads. Thus, so long as the seal provided by the surfaces remains effective, there should be no danger of the threads disengaging due to ballooning of the coupling.
(21 claims) (Also related to U.S. 1/7/83 (Appl. 456,526))

L5 ANSWER 39 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 82:15880 TULSA
DOCUMENT NUMBER: 325868
TITLE: RECORD WHIPSTOCK GETS DEEPEST TEXAS WELL BACK ON TRACK
SOURCE: DRILLING V 43, NO 11, PP 105-106, AUG 1982 (ISSN 00126241).
; Journal
LANGUAGE: English

AB Drilling the Cerf Ranch No. 1-9 passed the 29,622 ft mark June 24, 1982, to earn the title of deepest well in Texas. The Hunt Energy wildcat, located in Pecos County, ran into some difficulties at ca. 24,670 ft trying to sidetrack around a lost fish. Before the drilling report again read drilling ahead, 5 modern turbines had failed and a record was established for the deepest use of a whipstock. The running procedure was as follows: plugged back hole to 24,670 ft; tripped in with 6-1/4-in. **OD** open hole retrievable whipstock, 5-1/8-in. Tricone bit, 5-in. **OD** shear pin sub (which doubled) as a lead collar), 4-in. **OD** knuckle **joint**, and one **joint** of 2-7/8-in. **drill pipe** with a tele-orienter on top of it; oriented whipstock to the low side of the hole, sheared pin, and drilled down the 8-1/2 ft concave face of the whipstock and made 18 ft of 5-1/8-in. rathole; tripped out of the hole, picked up 6-1/2-in. diamond hole opening on 3-1/2-in. **drill pipe**; tripped in and opened the 18 ft of 5-1/8-in. hole to 6-1/2-in.; tripped out and picked up 5-1/2-in. Tricone button bit on 4-3/4-in. non-magnetic drill collar and 3-1/2-in. **drill pipe**; tripped in and made additional 18 ft to increase distance from cement plug; tripped out, picked up 6-1/2-in. diamond hole opener, 3-point reamer on 5-in. drill collar (21 total); and tripped in, reamed 36 ft of sidetracked hole.

L5 ANSWER 40 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 82:5597 TULSA
DOCUMENT NUMBER: 315585
TITLE: METHOD AND APPARATUS FOR CONNECTING STEEL PIPE SECTIONS
INVENTOR: HAUK, E D; STEWART, L
PATENT INFO.: US 4295526 19811020
APPLN. INFO.: US 1979-13671 19790221

SOURCE: US 4,295,526, C 10/20/81, F 2/21/79 (APPL 13,671) (SERVICE EQUIP DESIGN INC) (15 CLAIMS). ; Patent
LANGUAGE: English
AB This method provides an extremely strong and elastic alloy steel ring having an **inner diameter** substantially smaller than the **outer diameter** of the pipe to be joined, and an **outer diameter** much larger than the **outer diameter** of the pipe. Great axial forces are then employed to insert the pipe ends into the ring until an internal flange is abutted, thus stretching the ring without causing it to exceed its elastic limit. End seals are provided on the flange faces and are pinched off by the pipe ends, so that metal-to-metal contact results. Prior to forcing the pipe ends into the ring, it is mounted in an internal groove in a hinged clasp which aligns the pipe ends. The apparatus comprises the ring, the clasp and the seals, and further comprises the completed **joint** wherein the ring is under continuous great hoop stress. (15 claims)

L5 ANSWER 41 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:15113 TULSA
DOCUMENT NUMBER: 303885
TITLE: AVOIDING DOWNHOLE FAILURE. TRIP INSPECTION, TESTING GAIN FAVOR AS INSURANCE
AUTHOR: PITTS, J P
SOURCE: DRILL BIT V 29, NO 1, PP 50, 52, JAN 1980 (ISSN 00126225). ; Journal
LANGUAGE: English
AB As wells get deeper, pressures higher, and drilling costs go out of sight, operators try to buy more insurance to avoid costly down-hole failure. Trip inspection and testing are 2 insurance policies that are gaining more favor. The abuse applied to a string of **drillpipe** in a 20,000-ft well is excessive. Since even a minor fishing job is expensive, operators are willing to spend more on down- hole insurance and take extra precautions on deep wells to detect weak spots and possible failures in a drillstring before the failure happens. Since the cost of laying down a string of **drillpipe** for complete rack inspection can be costly, a logical alternative is to test and inspect the pipe as it is run. One method to test for cracks and pits in the tube is with an electromechanical inspection tool. Time saving, the nondestructive testing device is able to test the entire circumference of the pipe as it is tripped out of the hole at up to 90 fpm. It inspects for and detects **ID** and **OD** transverse fatigue cracks, corrosion pits and circumferential cuts.

L5 ANSWER 42 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:12049 TULSA
DOCUMENT NUMBER: 300821
TITLE: WELDING AND AUSTENITIZING EARTH BORING APPARATUS
INVENTOR: BOLTON, J B; CREWS, S T
PATENT INFO.: US 4256518 19810317
APPLN. INFO.: US 19790618
PRIORITY INFO.: US 1978-887005 19780316
SOURCE: U S 4,256,518, C 3/17/81, F 6/18/79, PR U S 3/16/78 (APPL 887,005) SMITH INTERNATIONAL INC. ; Patent
LANGUAGE: English
AB A box tool **joint** member of generally tubular configuration is adapted for securement by welding to one end of a steel tube to form a **drill pipe**. The box tool **joint** member comprises a body having a cylindrical outer periphery, an internally threaded socket at one end of the body, and a weld neck of smaller **outer diameter** than the body adjacent to the other end

of the body. A tapered transition piece connecting the neck with the adjacent end of the body provides an elevator shoulder. A correlative pin tool **joint** member is welded to the opposite end of the tube to complete the **drill pipe**. The box tool **joint** member has an annular band of hard facing over the outer periphery of the transition piece and extending down over the adjacent part of the weld neck and up around the adjacent part of the body. The hard facing is corrosion resistant and has a smooth finished surface. Underneath the hard facing and extending beyond both ends of the hard facing is an annular butter layer of nonhardenable steel. The tool **joint** member is hardened and tempered after the butter layer is welded into a body groove and before the hard facing is welded on. The butter layer is grooved before the hard facing is welded on. (7 claims)

L5 ANSWER 43 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:12030 TULSA
DOCUMENT NUMBER: 300802
TITLE: DRILLSHIP PUNCHES HOLES IN DEEP WATER
SOURCE: DRILLING CONTRACT V 37, NO 3, PP 104, 106, MARCH 1981 (ISSN 00460702). ; Journal
LANGUAGE: English
AB In its first year of operation, the Pacnorse I drilled in 1,650 ft of water for Amoco off Galway, Ireland; in 700 ft of water for AGIP in the Adriatic Sea off Italy; and in 1,850 ft of water for Phillips in the Bay of Biscay off N. Spain. The self-propelled, dynamically positioned drillship is scheduled to handle a 2- or 3-well drilling program for Chevron off Spain and Yugoslavia. During next summer's drilling season, it is slated to work for Petro- Canada off Newfoundland, where it may operate in water depths up to 3,500 ft. The 490-ft long vessel is rated for a drilling depth capability of 20,000 ft below the seafloor. It can operate in up to 5,000 ft of water. The main considerations that set deepwater drilling apart from other offshore drilling involve guidelineless re-entry and supporting the drilling riser system. The riser system on Pacnorse I includes 2,750 ft of buoyant riser with 40-in. **OD** and 300 ft of nonbuoyant riser with 18-5/8 in. **OD**. To support the riser, the vessel has 12 riser tensioners with total capacity of 960,000 lb and 45-ft stroke. Drilling in deep water with a long riser also requires a shock-absorbing gimbaled spider to eliminate shockloads. Also in use is a Vetco riser **joint** with fill-up valve. The ship's location is determined by satellite.

L5 ANSWER 44 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:8923 TULSA
DOCUMENT NUMBER: 297695
TITLE: **PIPE** CONNECTOR FOR **DRILL PIPE** OR SIMILAR (ROHRVERBINDUNG FUER BOHRROHRE **OD** .DGL.)
INVENTOR: PRINZ, G
PATENT INFO.: DE 2606880 19790419
APPLN. INFO.: DE 1976-2606880 19760220
SOURCE: GER 2,606,880, C 4/19/79, F 2/20/76 (APPL 2,606,880) STEFFE PRINZ & CO GMBH ABSTR, AUSZUEGE AUSLEGESCHRIFTEN (GER) V 25, NO 16, P 1475, 4/19/79 (IN GERMAN) (AO). ; Patent
LANGUAGE: German
AB In this connector for **drill pipe**, the male and female ends of the pipe lengths have radial holes into which fits a stress sleeve

with means for widening the sleeve. The sleeve has a longitudinal slot, and the tightening element is a slightly conical bolt. The sleeve is symmetrically conical on both inside and outside surfaces. The radial holes also are conical to match the sleeve and the threaded connector bolt has a threaded hole on the end toward the outside of the pipe. (Abstract only - original patent not available from T.U.)

L5 ANSWER 45 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 81:6024 TULSA
DOCUMENT NUMBER: 294796
TITLE: EVALUATION OF ENERGY CHARACTERISTIC OF **DRILL PIPE** COLUMN
AUTHOR: VARETSA, A I; NOROZHILOV, B A
SOURCE: IZV VYSSH UCHEB ZAVEDENII, GEOL RAZVEDKA NO 5, PP 149-156, MAY 1978 (IN RUSSIAN) (ISSN 00167762). ; Journal
LANGUAGE: Russian
AB Studies were performed by drilling with 16-mm **OD** crowns to the depth 900 to 1,000 m and with 59-mm **OD** crowns to the depth 550 to 650 m. Three hole-**drill pipe** column systems are distinguished: (1) hole with nominal diameter 76-mm and 50-mm **OD drill pipes** (tool **joints** 65 mm in diam); (2) hole with nominal diameter 59-mm and 50-mm **OD drill pipes** (tool **joints** 57 mm in diam); and (3) hole with nominal diameter 76 mm and **drill pipes** of KSSK type 70 mm in diam. The following regularities have been found: (1) for the same outside parameters, the wastes of energy can be various and can achieve credible values; and (2) the regime of **drill pipes** vibration for every system; hole-**drill pipes** are conditioned by section of column (not by whole column) (the length of this section in the studied systems was 150 to 300 m dependably on every concrete system); (3) dependance between energy which is necessary for idle rotation and rotation frequency is not smooth--static and dynamic regimes can be distinguished (the border between these regimes is within 130 to 260 rpm dependably on concrete system); and (4) the best results have been achieved using the column of KSSK pipes.

L5 ANSWER 46 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 80:17115 TULSA
DOCUMENT NUMBER: 288639
TITLE: PIPE SUB FOR DRILLING OPERATIONS AND METHOD FOR ITS MANUFACTURE (TRONCON DE TUYAU POUR OPERATIONS DE FORAGE ET PROCEDE POUR SA FABRICATION)
PATENT INFO.: FR 240606251179
APPLN. INFO.: FR 1977-30966 19771014
SOURCE: FR 2,406,062, 5/11/79, F 10/14/77 (APPL 30,966); SHELL INTERNAT RES MIJ BV; (AO). (IN FRENCH). ; Patent
LANGUAGE: French
AB This pipe sub has a male tool connector at one end and a female connector at the other end, and contains a helicoidally wound conduit with straight ends, the **outer diameter** of the helix being such that it touches the inner wall of the pipe. Both the pipe **joints** and the ends of the conduit are equipped with sealing means and are insulated, so that the electrodes in the conduit are insulated from the body of the sub. The electrodes are connected to each other by an insulated wire which passes through the conduit and its ends. This sub is used in drilling operations. (Abstract only - original patent not available from T.U.)

L5 ANSWER 47 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 80:14661 TULSA
DOCUMENT NUMBER: 286185

TITLE: DRILL ROD TELEMETRY CHANNEL
INVENTOR: DENISON, E B; DICKSON, L L; MARSH, G L
PATENT INFO.: AU 509652 19800522
APPLN. INFO.: AU 1977-29457 19771007
SOURCE: AUSTRAL 509,652, C 5/22/80, F 10/7/77 (APPL 29,457/77); SHELL INTERNAT RES MIJ BV (AO). ; Patent
LANGUAGE: English

AB A pipe section for use in borehole operations comprises a length of pipe, a pin tool **joint**, and a box tool **joint** arranged at opposite ends of the length of pipe. The **joints** have a smaller internal diameter than the length of pipe. A conduit has a helical form with straight end portions, the **outer diameter** of the helix being sized to firmly engage the innerwall of the length of pipe when the conduit is placed in the pipe. A passageway is formed in each of the tool **joints**, and the ends of the conduit are formed to align with the passageways. Sealing means are disposed in each of the passageways to form fluid-tight seals between the ends of the conduit and the passageways and in addition, to mechanically anchor the conduit in the passageways. Electrodes are carried by the tool **joints** through the intermediary of insulating means. The electrodes in opposite tool **joints** are in electric communication by means of an electric conductor that extends through the passageways and the conduit. (Abstract only - original patent not available from T.U.)

L5 ANSWER 48 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 80:14177 TULSA
DOCUMENT NUMBER: 285701
TITLE: INCREASE IN DURABILITY OF THREAD **JOINTS** OF **DRILL PIPES** DUE TO THE USE OF POLYMER POWDER
AUTHOR: LEVCHENKO, A T; GILMAN, K A; DOVGONOLYI, E N; PINCHUK, L C; PRISHLYAK, A M
SOURCE: NEFT GAZOVAYA PROM NO 2, PP 20-21, APRIL-JUNE 1978 (IN RUSSIAN) (ISSN 05481414). ; Journal
LANGUAGE: Russian

AB The increase in a corrosive-fatigue durability of thread **joints** of **drill pipes** can be achieved by use of poyethylene powder as the filler. The technical procedure was as follows: thread parts were cleaned, the thread **joint** was heated at a temperature of 380 to 400 C (heating at temperatures exceeding 380 to 400 C is inadmissible), and the layer of polyethylene powder (7 to 10 g) was alloyed. The thread **joints** of 114 mm **OD drill pipes** have been tested in the environment of aggressive drilling fluid (salt-saturated mud). It was found that the use of polyethylene powder as the sealing agent increased the durability of thread **joint** 1.9 times. The proposed method was successfully applied and practically proved in the drilling operations at the Ukraine's territories.

L5 ANSWER 49 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 80:12448 TULSA
DOCUMENT NUMBER: 283972
TITLE: WEAR PROTECTION FOR CASING AND TOOL **JOINTS**
AUTHOR: GOOCH, A; WALLACE, D W
SOURCE: INT JOINT ASME PETROL MECH ENG & PRESS VESSELS & PIPE CONF (9/19-24/76) PRT NO 76-PET-88, 3 PP, 1976.
LANGUAGE: English

AB This work is a report on a new hard surfacing development that presents a solution to prevent the major portion of the dangerous and expensive damage to oil well casing and also prevents wear to the **outer diameter of the tool joint** while rotating inside the

casing or out in the open hole. To better identify the problems involved, a laboratory casing wear test was developed to closely simulate the action of tool **joints** rotating in the casing while drilling. The experimental test work included approx. 50 different types of hard surfacing materials and techniques. These were tested in J55 and P110 casing using clear water and 8.7 lb/gal Aqua Gel mud. The results of these tests show that the new hard surfacing technique will wear the casing less than a tool **joint** without hard surfacing. The tool **joint** wear protection will be as good as, or better than, presently available hard surfacing.

L5 ANSWER 50 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 79:9715 TULSA
DOCUMENT NUMBER: 267403
TITLE: NEW METHODS TO TEST INTEGRITY OF TUBE
AUTHOR: TURNER, D
SOURCE: SPE OF AIME DEEP DRILLING & PROD SYMP (AMARILLO, 4/1-3/79) PREPRINT NO SPE-7851, PP 105-109, 1979.
LANGUAGE: English
AB While drilling goes deeper and deeper in efforts to solve America's energy requirements, greater pressures are required of the tubular used. A pipe failure at today's drilling depths causes astronomical problems, not to mention the expense. Electronic inspection and hydrostatic testing remain in the lead as the methods to accurately check the serviceability of the tube and its connections. Until recently, testing was a secondary method at best. Plugs were screwed onto the pipe connections by hand and the reliability of the test was constantly under question. Testing has been a very slow method of checking pipe, and the need for manpower and manual labor was phenomenal. In Oct. 1978, Gator Hawk, a Houston-based testing company, introduced a new patented automatic internal hydrostatic testing unit that automatically handles and tested tubing 1- to 3-1/2-in. **OD**. A patented casing unit is now under development by Gator Hawk that allows automatic testing of sizes ranging from 4 to 13-3/8 in. The Gator-log testing system incorporates the low torque makeup system along with an automatic handling system and strip chart for maintaining a permanent record of the test.

L5 ANSWER 51 OF 51 TULSA COPYRIGHT 2000 UTULSA
ACCESSION NUMBER: 79:7919 TULSA
DOCUMENT NUMBER: 265607
TITLE: **DRILL PIPE** WEAR BELT ASSEMBLY
INVENTOR: GARRETT, W R
PATENT INFO.: US 4146060 19790327
APPLN. INFO.: US 1977-818672 19770725
SOURCE: U S 4,146,060, C 3/27/79, F 7/25/77 (APPL 818,672); SMITH INTERNATIONAL INC. ; Patent
LANGUAGE: English
AB A steel wear belt having a prepared inner surface with an **inner diameter** large enough to pass over the weld upset on one end of a **drill pipe** tube but too small to pass over the tool **joints** is installed about the pipe. Preferably, the belt **outer diameter** is equal to or less than that of the tool **joints**. The belt is installed prior to one or both tool **joints** being welded to the tube. The belt is secured to the tube by a mounting layer of high polymer material, e.g., plastics or elastomer, preferably self- bonding and thermo-set, between the prepared surfaces. The mounting layer may have a thickness in the range of 1/16 to 1/4 in. and an elastic modulus of not over 5% of that of steel, and an elastic shear strength of 500 to 3,000 psi, and be stable up to 250 to 300 F. The

thickness of the mounting and its physical properties prevent stress concentration in the pipe and prevent electrolytic corrosion between the pipe and wear belt. The pipe is plastics coated internally from tool **joint** to tool **joint**. The internal coating and the wear belt mounting are preferably cured simultaneously and may both be made of phenolic or epoxy or, preferably, phenolic-epoxy synthetic resin. Otherwise, an elastomer would be preferred for the belt mounting. (12 claims)

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   FILE 'TULSA' ENTERED AT 11:06:11 ON 26 JUN 2000
L1          7628 S DRILL(2A)PIPE OR DRILLPIPE
L2          9043 S PIPE(2A)(JOINT OR FITTING)
L3         24657 S (6 OR SIX)
L4         17940 S 7 OR SEVEN
L5             7 S L1 AND L2 AND L3 AND L4
L6             0 S (SEVEN OR 7)(2A)IN.
L7             1 S (SEVEN OR 7)(2A)IN
L8           327 S L1 AND L3
L9            17 S L1(3A)L3
L10          860 S INCH? OR IN
L11            0 S L9(5A)L10
L12            2 S L4(3A)L2
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Karen Lehman EIC 3600